1994 LOWER COOK INLET AREA

ANNUAL FINFISH MANAGEMENT REPORT

by
Wesley A. Bucher
and
Lee Hammarstrom

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1994 COMMERCIAL FISHERIES MANAGEMENT & DEVELOPMENT STAFF

The finfish operations for the Commercial Fisheries Management and Development Division, Lower Cook Inlet, employed eight permanent employees and nine permanent-seasonal employees in various area management and research programs during the 1994 season. Appreciation is extended to all personnel for a successful program during 1994.

Permanent Employees during the 1994 season:

Wesley A. Bucher	Area Finfish Management Biologist
Lee Hammarstrom	Assistant Area Finfish Mgt. Biologist
Henry Yuen	Finfish Research Project Leader
Nick Dudiak	Area Development/Sport Fish Biologist
William Bechtol	Region Groundfish Biologist
Marnee Beverage	Administrative Clerk III
Paul Desjardin	Boat Officer
Craig M.K. Forrest	Assistant Boat Officer

Seasonal Employees:

Tom Balland	Fisheries Biologist I
Mark Dickson	Fish & Wildlife Technician IV
Greg Demers	Fish & Wildlife Technician III
Michael Holman	Fish & Wildlife Technician III
S. Tom Sigurdsson	Fish & Wildlife Technician II
Trish McNeill	Fish & Wildlife Technician II
Phil Cowan	Fish & Wildlife Technician II
Carla Milburn	Fish & Wildlife Technician II
Elaine Chalup	Adminstrative Clerk II

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

LIST OF SALMON TABLES

LIST OF HERRING TABLES

LIST OF SALMON FIGURES

LIST OF SALMON FIGURES
(continued)

LIST OF HERRING FIGURES

LIST OF SALMON APPENDIX TABLES

LIST OF SALMON APPENDIX TABLES
(continued)

LIST OF SALMON APPENDIX TABLES
(continued)

LIST OF HERRING APPENDIX TABLES

ANNUAL MANAGEMENT REPORT
LOWER COOK INLET
1994

COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area is comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, and is divided into five fishing districts (Figure 1). The Barren Islands District is the only non-salmon fishing district, with the remaining districts (Southern, Outer, Eastern, and Kamishak Bay) separated into approximately 40 subdistricts and sections to facilitate management of discrete stocks of salmon and herring.

Despite a total catch nearly 40% greater than the 1974-93 average, the 1994 commercial season was the fifth consecutive economic hardship experienced by the LCI salmon fleet. A continued trend of depressed prices for both sockeye and pink salmon led to a total LCI exvessel value of $1.382 million, the second lowest since 1976 (Table 7, Appendix Table 2). The overall harvest of 1.78 million fish (Figure 8, Appendix Table 5) exceeded the preseason forecast by over 80% and was over 50% greater than the all-species average over the past 10 years. Fishing effort decreased over 1993 levels with only 32 seine and 16 set gillnet permit holders making deliveries (Appendix Table 1).

The brightest spot of the 1994 LCI salmon season was undoubtedly the exceptional return of pink salmon to the Tutka Bay Hatchery in

the Southern District. Over 1.7 million pink salmon (Table 9) returned to area waters as a result of hatchery programs, easily surpassing the previous record high of 1.1 million pinks in 1981 and providing over 96% of the entire LCI pink harvest (Appendix Table 18). Returns of naturally produced pinks to LCI waters were generally weak, as would be expected during even years. Sockeye returns were a major disappointment, with a total catch of only 115,400 fish (Appendix Table 13) or about 42% of the pre-season forecast. Nearly 80% of the sockeye salmon harvest resulted from Cook Inlet Aquaculture Association (CIAA) lake stocking projects throughout Lower Cook Inlet.

One notable factor affecting the amount and distribution of fishing effort within the LCI management area during the 1994 salmon season concerned tender service. Standard practice in past years was for local processors to station a tender (or tenders) in remote districts in anticipation of salmon harvest and subsequent deliveries. This practice was abandoned in 1994, however, which forced fishermen to devise their own means to transport fish from these remote areas to a processing plant in Homer or elsewhere. Some fishermen, due to equipment limitations and the high cost of contracting out, were unable to fish in remote areas, while others retained the flexibility to fish these traditional areas because of on-board chilling equipment.

PRESEASON FORECAST

The 1994 LCI salmon harvest was projected to be only 78% of the most recent 20-year average. The majority of the harvest was expected to come as a result of hatchery and lake stocking enhancement projects involving pink and sockeye salmon. Formal total run forecasts for natural salmon returns other than pink salmon were not prepared because escapement and age-weight-length data are limited for those species. However, catch projections

were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends. Harvest potential and actual catches for all species in 1994 are listed in the following table:

SPECIES	PROJECTED HARVEST	ACTUAL HARVEST	1974-1993 AVERAGE
Chinook	*NO FORECAST*	1,231	1,089
Sockeye	272,000	115,418	169,038
Coho	*NO FORECAST*	14,673	12,407
Pink	595,000	1,647,929	992,654
Chum	111,000	5,469	104,171
TOTAL	978,000	1,784,720	1,279,359

Strong sockeye returns were anticipated in all areas, with the exception of English Bay in the Southern District and Chenik Lake in the Kamishak Bay District. Enhanced runs to Leisure and Hazel Lakes in the Southern District and Kirschner Lake in the Kamishak Bay District were expected to dominate the sockeye returns. Although Chenik Lake has benefited from regular fry stocking and intermittent fertilization during recent years, as well as from recent natural spawning escapements of up to 17,000 fish, adult sockeye returns in 1994 were expected to be relatively poor due to an epizootic of Infectious Hematopoietic Necrosis Virus (IHNV) within the system, and the entire run was to be protected for escapement. Additional adult returns resulting from sockeye enhancement projects at Bear Lake in the Eastern District and Bruin Lake in the Kamishak Bay District were anticipated to contribute to commercial harvests.

The 1994 LCI pink salmon harvest was expected to total slightly less than 600,000 fish. Generally poor 1992 pink salmon escapements to major systems contributed to a harvest projection of

115,000 naturally-produced pinks throughout the entire LCI management area this season, with Port Dick and Nuka Bay in the Outer District forecast to provide the largest harvestable surpluses. Natural pink returns were expected to be weak in all other districts.

Returns to the Tutka Bay Hatchery and a secondary fry release site at Halibut Cove Lagoon were expected to be the mainstay of the pink salmon fishery. A harvest of 390,000 pinks was expected as a result of fish returning to Tutka Bay Hatchery, with an additional 90,000 fish projected for Halibut Cove Lagoon. Nearly 30 million fry were released in 1992 at these locations and typical ocean survival rates for even-year runs should have produced adult returns approaching 600,000 fish.

Significant chum salmon harvests appeared unlikely in 1994. Although Kamishak Bay District systems experienced relatively good escapements during the 1989 parent year, poor escapements occurred during the following year, also a brood year for the 1994 adult return. Additionally, a trend of weak returns over the past four seasons suggested that the 1994 chum return would likely be weak as well.

SUMMARY BY SPECIES

Chinook Salmon

The harvest of chinook salmon, not normally a commercially important species in LCI, was the lowest since 1987 at 1,200 fish and was only 86% of the recent 10-year average (Appendix Table 12). The catch was primarily due to enhanced production in Halibut Cove Lagoon and Seldovia Bay (Table 2). Ninety percent of the chinook harvest was taken by set gillnet fishermen with the remainder harvested by purse seine gear (Table 1).

Sockeye Salmon

The total LCI harvest of 115,400 sockeyes was less than half the recent 10-year average (Figure 9, Appendix Table 13). Although the harvest was nearly 60% less than the preseason projection of 272,000 fish, and only accounted for 6.5% of the total number of fish landed in 1994, the sockeye catch comprised over one-third of the total value of the LCI fishery (Table 7, Appendix Table 2).

Returns of sockeye salmon to Mikfik Creek in the Kamishak Bay District initially appeared weak as escapement was slow during early June. Although the McNeil River Subdistrict opened to fishing on June 1 by regulation, no seiners ventured to the area, primarily because lack of tender service in the district discouraged fishermen from investing the time and effort for potentially meager returns. Without any fishing effort on this stock, escapement continued uninhibited by commercial harvests through June and early July, with the cumulative escapement index of 9,500 fish (Appendix Table 23) exceeding the goal of 5-7,000 fish.

Returns to enhancement projects, which account for the bulk of the sockeyes harvested in LCI, were poor in 1994. Combined harvests at China Poot (Leisure Lake) and Neptune Bay (Hazel Lake), both in the Southern District, fell far short of preseason projections, with a final catch of 50,500 fish (Appendix Table 15) or only 42% of the forecast. Although no harvest was forecasted for Chenik Lake in the Kamishak Bay District, primarily due to the outbreak of IHNV, the actual return of only 800 sockeyes was quite discouraging. Kirschner Lake, also in the Kamishak Bay District, produced a total harvest of 31,300 sockeyes (Table 3), marking it as the only LCI system to achieve its preseason forecast. The return of sockeye salmon to an enhancement site at Bruin Lake in the Kamishak Bay

District approached the preseason projection, while at Bear Lake in the Eastern District the return was greater than previous years' returns but once again below expectations.

Natural sockeye runs to Delight and Desire Lakes in the East Arm of Nuka Bay in the Outer District were not strong although the escapement goal of 10,000 fish at Desire Lake was surpassed (Appendix Table 23) and a small surplus afforded the fleet a modest harvest of 5,900 fish (Table 3). At Delight Lake the peak estimated escapement of 5,600 fish was only slightly more than half of the goal, marking the sixth consecutive year in which the desired level was not reached (Appendix Table 23). Returns to Ecstasy (Delectable) Lakes, a recently formed glacial lake system in East Nuka Bay which supported no documented salmon runs prior to the mid-1980's, had a peak aerial escapement estimate of 1,300 sockeye salmon during 1994.

Sockeye returns to the English Bay Lake system were the highest recorded since 1982, surpassing the minimum escapement goal of 10,000 fish for the first time in the past nine years. A complete closure of the commercial, sport, and subsistence fisheries for the duration of the sockeye run this year resulted in a total estimated escapement of 13,800 fish (Appendix Table 23). At Aialik Lake in the Eastern District, a final escapement of 7,300 sockeyes exceeded the upper goal of 5,000 fish (Appendix Table 23). Despite two open 48-hour fishing periods per week, no sockeyes were commercially harvested from the Aialik Lake return.

Coho Salmon

The coho harvest of 14,700 fish slightly exceeded the recent average (Appendix Table 17). However, over two-thirds of the harvest was taken in the Eastern District (Table 1) as a result of Bear Lake hatchery cost recovery efforts, Seward Silver Salmon Derby catches, and incidental harvests during the commercial pink

salmon seine fishery in Aialik Bay. Despite above average run strengths to most systems, and exceptionally large average weights, very little effort was directed towards cohos during the latter part of the season, thus contributing to the low harvests of non-enhanced stocks.

Pink Salmon

Returns of pink salmon, normally the dominant species in numbers of fish, were considered extraordinary for Tutka Hatchery but relatively poor for the remainder of the management area. The area-wide harvest of 1.648 million fish (Appendix Table 18) exceeded the recent 10-year average by 43% and was nearly three times greater than preseason projections. The commercial harvest (including cost recovery) of hatchery pinks from Tutka Bay was 1.452 million fish (Table 9), while Halibut Cove Lagoon, a secondary release site for Tutka Hatchery fry, contributed an additional 106,000 fish to commercial catches this season. Of these totals, approximately 953,000 fish (61%) were utilized for hatchery cost recovery, with the remaining 39% taken in the common property fishery. An additional 154,000 fish were collected for hatchery brood stock purposes.

Outside of the Southern District, only the Eastern District produced any other significant pink catches during 1994. Late season effort in Aialik Bay in the Eastern District resulted in a pink catch of 45,000 fish (Table 5). The Outer District produced a catch of only 13,000 pinks, almost entirely from the East Arm of Nuka Bay (Table 5), while no harvest of pinks occurred in Kamishak Bay. Low prices for pinks again in 1994, as well as the relatively weak returns, contributed to the scant harvest of naturally produced pinks.

Pink salmon escapements failed to achieve goals at most major LCI systems during 1994 (Table 5, Appendix Table 24), with the notable

exceptions of Island Creek in Port Dick of the Outer District and all systems in Resurrection Bay of the Eastern District. The low levels of directed effort for pinks ensured that the majority of natural returns, despite their weak strength, were allowed to enter streams to spawn.

Chum Salmon

The LCI chum salmon harvest of 5,500 fish was the second lowest ever recorded and continued a trend of depressed commercial chum catches experienced during the past five years (Figure 8, Appendix Table 21). The poor returns were somewhat surprising based on early season returns to other management areas throughout the state. However, conservative fishing schedules were implemented early in the season throughout the Kamishak Bay and Outer Districts to protect chum salmon stocks. The strategy paid off as most major systems achieved or approached their desired escapements (Table 6, Appendix Table 25). Prices paid for chum salmon, at $0.25 per pound, were the lowest in over 20 years.

EXVESSEL VALUE

The unadjusted exvessel value of the 1994 salmon harvest in LCI was approximately $1,381,700 (Table 7, Appendix Table 2), making it the second lowest since 1976. Purse seine gear in the common property fishery, which normally accounts for the majority of the catch, comprised $722,000 or 52% of the overall total (Table 7). Set gillnets accounted for $135,000 (10%). An estimated $498,200, or about 36% of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes. Average prices paid to fishermen in 1994, not including any postseason adjustments, were as follows: chinook - $0.95/pound; sockeye - $1.06/pound; coho - $0.62/pound; pink - $0.15/pound; and chum - $0.25/pound (Appendix Table 3).

DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

An Area H set gillnet permit holder is allowed to fish in both Upper and Lower Cook Inlet, but there are only five beach areas in LCI, all located along the south shore of Kachemak Bay in the Southern District, where set gillnets may be used (Figure 2). The limited area provides only enough productive fishing sites to accommodate approximately 25 set net permits.

The Southern District set gillnet harvest totalled 42,200 fish in 1994 (Table 1). The mixed-species harvest was only about two-thirds of the 1974-93 average, yet it was the highest total since 1988 (Appendix Table 7). Set gillnet catches were marked by increased percentages of chinooks and pinks compared to the long-term average and decreased percentages of sockeyes and cohos (Appendix Table 7). Typically the gillnet harvest is comprised of about 50% sockeye salmon, 38% pink salmon, 6% chums, 5% cohos, and 1% chinooks. An additional 24 hours of fishing per week was allowed in the Halibut Cove area from July 5 through the end of the season, resulting in an increased harvest of all species in this subdistrict.

Coho catches by set gillnets were only one-third of the long-term average (Appendix Table 7), not reflecting the generally strong natural returns throughout the rest of the management area. The chinook salmon catch of 1,100 fish represented the fifth highest set gillnet total for this species on record (Appendix Table 7). The high catches were primarily due to chinook salmon returning to enhancement projects at Halibut Cove Lagoon and Seldovia Bay.

At least two factors contributed to the below average set gillnet harvests in 1994. In anticipation of a weak sockeye salmon return to English Bay Lakes in the Southern District, the Port Graham Subdistrict, including the English Bay Section, was closed to both commercial and subsistence set gillnet fishing, while the freshwater drainage was also closed to sport fishing, all for the duration of the sockeye return. With these closures in place, the sockeye salmon escapement to the English Bay system exceeded the low end of its desired escapement range of 10,000 to 20,000 fish for the first time since 1984 with a total of 13,800 fish (Table 3, Appendix Table 23). After the sockeye run was effectively over, the commercial fishery in Port Graham and English Bay was kept closed to protect pinks returning to Port Graham River.

Overall fishing effort also affected the set gillnet harvest in the Southern District. The number of set gillnet permits actively fished in LCI this season (16) was the lowest since the limited entry permit system was instituted in 1975 (Appendix Table 1).

Seine Fishery

Sockeye Salmon

Purse seiners in the common property fishery accounted for 74% of the 64,500 sockeye salmon landed in the Southern District in 1994 (Table 1). The overall catch by all gear types was less than 60% of the recent 10-year average for the district (Appendix Table 13).

As in recent years, waters of China Poot Bay and Halibut Cove Subdistricts, and a portion of the Tutka Bay Subdistrict, were opened to seining five days per week beginning Thursday, June 25, in anticipation of strong returns to Leisure Lake. Within these subdistricts, waters of the China Poot and Hazel Lake Special Harvest Areas (SHA's) were opened only to authorized agents of CIAA at this time, seven days per week, for the purpose of hatchery cost

recovery; they were to be kept closed to the common property commercial fishery until the revenue goal at each SHA was achieved. Preseason combined harvest projections for returns to the Leisure and Hazel Lakes stocking projects were estimated at 120,000 fish. The actual harvest, including cost recovery, amounted to only 50,500 fish (Appendix Table 15), comprising 44% of the total LCI sockeye salmon harvest (Table 3, Figure 5). Because of the geographic proximity of these two projects, the overlapping area of harvest, and the lack of tagging, no definitive estimate of separate returns to each system can be established. However, fish returning as a result of these two projects undoubtedly contributed to seine catches in the Halibut Cove and Tutka Bay Subdistricts, as well as those in China Poot Bay Subdistrict. Personal use dip net fishermen and sport fishermen harvested another 9,000 sockeyes at the head of China Poot Bay. The 1994 total return from both projects was estimated at 59,500 sockeyes (Appendix Table 15).

As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the revenue goal necessary to meet operational expenses incurred in LCI sockeye salmon lake stocking projects was set at $52,455, to be split amongst cost recovery harvests as follows: 44% from China Poot SHA and 31% from Hazel Lake SHA, both in the Southern District; and 25% from the Kirschner Lake SHA in the Kamishak Bay District. No cost recovery was planned at Chenik Lake since returns were expected to be weak. Cost recovery harvests inside the China Poot and Hazel Lake SHA's (Figures 3 and 4) were to occur at CIAA's discretion early in the runs since harvests would take place without interference or competition from the fleet at large. Projected harvests of 5,800 sockeyes at the China Poot SHA and 3,300 sockeyes at the Hazel Lake SHA were necessary to achieve the combined goal of $36,300 for the two areas, assuming an average price of $1.00 per pound and an average weight of 4.0 pounds per fish. As previously described, these SHA's were to remain closed to common property seining until the goal established for each was achieved.

Only a single vessel was contracted by CIAA to harvest fish for cost recovery in the combined China Poot/Hazel Lake Special Harvest Areas. In addition, this vessel also supplemented cost recovery harvest efforts for pink salmon at Tutka Hatchery. This situation differed greatly from previous years, when Cook Inlet Seiners Association (CISA) retained the contract to harvest fish for cost recovery. CISA generally had greater flexibility because typically more than one seine vessel could be utilized depending upon the nature of the return to a specific area.

The first cost recovery harvest in the China Poot and Hazel Lake SHA's on July 5 netted only 317 fish, indications of a relatively weak return. Over the next one to two weeks, little buildup of fish in the two SHA's occurred due to the weakness of the returns, making cost-effective seining nearly impossible for the contracted vessel. Through July 15, the combined cost recovery catch of 3,000 fish from both areas accounted for only $8,500 or less than one-fourth of the total goal. The low catches compelled CIAA to abandon further cost recovery efforts at China Poot and Neptune Bays, opting instead to shift the remainder of the revenue goal to the Kirschner Lake SHA in the Kamishak Bay District. Although this move was opposed by some members of the fishing fleet, the Annual Management Plan allowed for such action at the discretion of the aquaculture association.

Once CIAA had decided to cease cost recovery in the China Poot Subdistrict, the two SHA's there were opened to commercial common property seining five days per week beginning July 19. Common property catches were the highest of the season on that opening day, but catches of only 3,700 sockeyes taken by eight vessels in the China Poot Section and 1,800 sockeyes taken by two vessels in the Hazel Lake Section on that day further reinforced the fact that returns were extremely weak. Historical run timing suggested that the returns already were past their peaks by this time, and commercial catches steadily declined thereafter. The final

commercial catch in the two sections, including cost recovery, was only 32% of the preseason forecast of 120,000 fish for both projects.

Pink Salmon

Returns of pink salmon to the Tutka Bay Hatchery and to the satellite rearing project at Halibut Cove Lagoon contributed to an overall Southern District harvest of 1.59 million pink salmon, a new record for the district (Table 5, Appendix Table 18). The opening of Halibut Cove Lagoon to seining was delayed until July 5 to allow the recreational fishery, targeting on hatchery reared chinook salmon, to continue through the 4th of July holiday without interference from the commercial seine fleet. Waters of Tutka Bay Subdistrict outside of Tutka Bay proper were open to commercial seining five days per week beginning June 25, while waters within the Tutka Bay SHA (Figure 5) were open to hatchery brood stock and cost recovery harvest by authorized agents of CIAA on a continuous basis as established in the Tutka Hatchery Annual Management Plan. The plan called for hatchery incubators to be filled to maximum capacity if possible, and excess fish beyond brood stock and natural escapement requirements were to be harvested for cost recovery to help offset operational expenses. A minimum of 133,000 fish (83,000 females) were necessary for hatchery brood stock in order to achieve the goal of 125 million eggs, and an additional 10,000 pinks were needed to meet the natural spawning escapement goal for Tutka Creek.

Early commercial catches during the first days of July in the outside waters of Tutka Subdistrict were slow, but pink salmon abundance was building within Tutka Lagoon during this time. Cost recovery harvests began on July 5, with harvests occurring primarily in Tutka Lagoon and secondarily in waters of Tutka Bay Special Harvest Area outside the lagoon. Daily cost recovery

harvests averaged about 35,300 pinks for actual days fished between July 5 and August 4. Harvests peaked July 16 through 18 when daily catches averaged over 64,000 fish.

At one point, tender capacity for the cost recovery harvests became a concern. CIAA was unable to arrange for a sufficient number of tenders during a two-day period in mid-July. Realizing that a major buildup of fish in the lagoon during this time could result in a reduction in product quality, the staff and CIAA mutually agreed that a short opening for the common property fishery in waters between the Tutka SHA and the open outside waters of Tutka Bay, an area closed to all commercial fishing, would help slow down the buildup in the lagoon but would still allow enough fish through to provide for resumption of cost recovery harvests as soon as tenders became available. As a result, waters of Tutka Bay between the HEA power lines and the Tutka Bay Lodge were opened to continuous common property seining for a total of 81 hours between July 19 and July 23. The strategy was highly effective as the seine fleet harvested over 150,000 fish while CIAA cost recovery was not measurably disrupted.

The last hatchery harvest took place on August 4, with the final tally totalling 953,400 pinks taken for cost recovery. Additionally, 154,000 pinks were captured for brood stock, and the natural escapement goal for Tutka Creek was achieved. Therefore, waters of Tutka Bay outside of Tutka Lagoon were opened to common property seining on August 8, while waters of Tutka Lagoon were opened on August 9, with both areas open on a five day per week basis from Monday 6:00 a.m. through Saturday 6:00 a.m. The pink return, however, was effectively over by this time as evidenced by the negligible harvests on August 8 and 9. No further seine harvest or effort occurred in Tutka Bay or Lagoon after these dates.

The total commercial catch of pink salmon in Tutka Bay Subdistrict this season, including both seine and setnet catches but excluding hatchery cost recovery, was 498,400 fish (Table 5). A total of 953,400 pinks were sold by CIAA for cost recovery, with 154,000 fish harvested for brood stock (Table 9). An additional 5,800 pinks were taken for cost recovery but were not sold and were subsequently dumped. The pink salmon escapement of 14,500 fish (Table 5, Appendix Table 24) into Tutka Creek exceeded the desired goal of 10,000 fish, but was once again assumed to include a high proportion of males discarded during hatchery egg-take operations.

Returns of wild pink salmon stocks to other systems in the Southern District were variable as indicated by ground survey escapement counts. Desired minimum escapements were achieved at China Poot Creek, Tutka Creek, and Seldovia River, while escapements fell short at Humpy Creek, Barabara Creek, and Port Graham River (Table 5, Appendix Table 24).

Other Species

Southern District chum salmon returns were poor for a sixth consecutive year. Nonetheless, the chum harvest of 2,600 fish (Table 6) represented the second highest total since 1989 despite being just 60% of the recent 10-year average for the district (Appendix Table 21). Set gillnets accounted for 92% of the harvest (Table 1), with 46% of the district-wide catch landed in the Seldovia Bay Subdistrict (Table 6).

Although minor in total numbers of fish, the majority of the Southern District chinook harvest usually consists of incidental catches of adult fish returning to three separate enhancement projects. The 1994 harvest of 1,230 chinooks was the lowest since 1987 (Appendix Table 12), with 90% taken by set gillnetters. The coho salmon harvest of 1,400 fish was only 35% of the recent 10-year average (Appendix Table 17).

Kamishak Bay District

Sockeye Salmon

The entire Kamishak Bay District, with the exception of the Paint River Subdistrict, opened to salmon seining by regulation on June 1, with two regular 48-hour weekly fishing periods established by emergency order. However, the earliest sockeye salmon return to the management area, at Mikfik Creek, appeared weak as evidenced by initial aerial surveys, and fishermen were unwilling to gamble on fishing this traditionally small return considering the lack of tender service to this remote district. Therefore, the Mikfik sockeye return went unharvested during 1994 and all fish were allowed to escape into freshwater. The peak aerial survey, conducted on June 23, estimated 7,300 sockeyes in fresh water at Mikfik Creek. The final escapement index at Mikfik Creek was estimated at 9,490 sockeyes (Table 3), exceeding the desired range of 5,000 to 7,000 fish (Appendix Table 23).

With no early effort directed toward sockeye salmon in the McNeil River Subdistrict, seiners began their season in the Douglas River Subdistrict during the last days of June. Normally effort would be directed towards the Chenik Lake sockeye return, however no fishing was expected to occur at Chenik Lake this year due to the effects of the IHNV outbreak in previous years and the subsequent decrease in adult returns. Sockeye catches at "Silver Beach" in the Douglas River Subdistrict proved to be disappointing as well, with only 3,400 fish landed between June 28 and July 1. No further effort on sockeyes occurred in this subdistrict during the remainder of the season.

At Chenik Lake, despite the forecasted weak return, the staff was hopeful that the run would at least approach the escapement goal of 10,000 sockeyes. Unfortunately, the "worst case" scenario

manifested itself in the return, and even with no fishing effort occurring during the entire season, the total escapement past the weir at Chenik Lake was only 808 sockeyes.

With no fishing effort at Chenik, attention was next focused on nearby Kirschner Lake in the Bruin Bay Subdistrict. Kirschner Lake is also the site of a sockeye salmon lake stocking program, but a steep falls at the tideline precludes escapement into the lake. Preseason management strategy for the Kirschner Lake Section of the Bruin Bay Subdistrict, as outlined in the Crooked Creek AMP, was to open the Kirschner SHA (Figure 7) to cost recovery on a continuous basis beginning June 16 while keeping it closed to common property seining, thus allowing opportunity for CIAA to achieve the sales harvest goal of $13,115 at the beginning of the run. As soon as the goal was met, Kirschner SHA was to be closed to cost recovery harvest and opened to commercial seining so the fleet could work the area uninhibited for the remainder of the season. Once again, the preseason average price for sockeyes was projected to be $1.00 per pound, and at an average weight of 4.0 pounds per fish, CIAA needed to harvest approximately 3,300 sockeye salmon in order to achieve the revenue goal at Kirschner. The preseason projected return to Kirschner Lake was 30,000 sockeyes.

Although CIAA had made arrangements prior to the season for a vessel to conduct the harvest, there was considerable controversy, both during and after the season, when efforts did not proceed according to the preseason schedule. Difficulties began when the run timing was delayed, and the cost recovery vessel departed the LCI management area to participate in the Prince William Sound (PWS) fishery. A commercial spotter pilot was subsequently assigned to monitor the Kirschner area in hopes of detecting a significant build-up of fish.

On July 21, 10-14 days after the normal run timing, it was reported that an estimated 30,000 pounds of fish were present at the

waterfall. However, by this time it had become apparent that the sockeye revenue goals for the China Poot and Hazel Lake SHA's in the Southern District would not be achieved due to weak returns to those systems. Therefore, the decision was made by the executive director of CIAA to make up the deficit by increasing the goal at Kirschner Lake. This decision was in keeping with a provision in the Crooked Creek Hatchery AMP drafted specifically for such an occasion. With a total LCI sockeye goal of $52,455, and a Southern District harvest valued at only about $15,000, a revised value of over $37,000 was needed from Kirschner Lake cost recovery harvests. When the fisherman who had originally agreed to undertake the cost recovery harvest was informed of the decision to harvest all of the fish present at Kirschner to meet the revenue goal, he no longer felt obligated to perform the service because he believed the terms of the agreement had been significantly altered. Nevertheless, he travelled back to the area to assess the situation personally.

There were various estimates of the number of fish present inside the SHA, as well as widespread speculation on whether the number was adequate to meet the revenue goal. However, as attention became focused on the area, most observers believed the number of fish was not only sufficient to achieve the revenue goal, but also that there would be a substantial amount left over for a common property harvest. Nonetheless, given all the speculation as to the numbers of fish and the long delays in harvesting them, the fleet was reluctant to travel to the area before being assured that the revenue goal would in fact be achieved.

Questions also arose regarding the amount of advance notice time that would be allowed prior to a commercial opening. Fishermen were concerned about having enough time to travel to the Kamishak Bay District to participate in the opening once the revenue goal had been achieved. The staff assured the fleet that they would get adequate notice before the SHA was opened to the common property harvest.

After prolonged communications with the staff and CIAA, the original cost recovery vessel finally elected to abandon the effort and departed the area on July 25 for a second time. Several days passed before arrangements could be made for another vessel to harvest the fish. Finally the *F/V LINDY* (Southern District cost recovery vessel) travelled to the Kamishak Bay District, and 53,450 pounds of sockeyes were landed in Homer on July 29. The value of this poundage should have exceeded the amount necessary to achieve the revised revenue goal, however the delays in harvesting resulted in a deterioration of overall product quality along with a substantial decrease in value, causing the harvest to fall short of the revised goal by about $10,000. CIAA subsequently decided to cease further cost recovery efforts in the Kamishak Bay District, therefore the Bruin Bay Subdistrict, including the Kirschner Lake SHA, was opened to common property fishing five days per week at 6:00 a.m. Monday, August 1.

Four boats were present for the opening and harvested another 42,000 pounds (13,500 fish) over the next three days. It was reported that a small quantity remained, but poor weather forced the fleet to abandon the area until August 8, when an additional 1,000 sockeyes were caught for the last delivery of the season.

Based on disappointing first-year returns during 1993, preseason projections for sockeye salmon returns resulting from enhancement efforts at Bruin Lake, the outlet of which empties into Bruin Bay proper about five miles southwest of Kirschner Lake, ranged only to 5,000 fish. Fishermen once again reported difficulty locating sizeable concentrations of fish in the shallow waters near the mouth of Bruin Lake Creek, and only 600 sockeyes were harvested in Bruin Bay proper during the season. In August, aerial survey estimates at Bruin Lake Creek ranged as high as 4,000 sockeyes, blocked from ascending to the lake by a series of barrier falls.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District were poor, with no commercial harvest forecasted for any subdistrict. Inseason aerial surveys throughout the months of July and August bore out this prediction with estimates of meager runs to all major systems. Low pink prices and dismal returns discouraged effort for pinks in Kamishak Bay all season. The harvest total of less than 50 fish, taken incidentally during directed sockeye efforts, represents a record low for this district (Appendix Table 10). None of the pink systems in the Kamishak Bay District achieved the desired escapement goals, falling short in all cases by sizeable amounts (Appendix Table 24).

Chum Salmon

Cumulative chum salmon catches for the entire Kamishak Bay District totalled just 14 fish, the lowest harvest in the history of the fishery since statehood (Appendix Table 21). No effort was directed specifically at chums in the Kamishak Bay District due to the low prices caused by the decrease in market demand during 1994.

Chum salmon escapement into McNeil River began to increase during the first week of July. However, weather and water conditions hampered aerial enumeration for a period after this initial increase, and escapements were not well documented for nearly three weeks. On July 26, the peak daily escapement count for the season occurred with 6,100 fish observed, representing less than one-third of the low end of the escapement range. Despite the fact that no commercial effort was occurring in the McNeil River Subdistrict or in any Kamishak Bay subdistrict south of McNeil River, chum escapement counts at McNeil River decreased slightly during the next two weeks. Even though returns appeared weak, the McNeil River Subdistrict was allowed to remain open through the 1994 season in hopes that enough fish would be landed to obtain an

adequate age-weight-length (AWL) sample. However, the staff maintained a continuous dialogue with the fleet and made it abundantly clear that any significant catch of chums without a corresponding increase in the escapement rate in McNeil River would result in immediate closure of the subdistrict. This strategy proved effective at protecting the chum return from any fishing mortality, allowing the entire run to enter the river. However, with an escapement goal of 20,000 to 40,000 chums for this system, the numbers of fish present were not sufficient to achieve the in-river goal. The final estimated escapement index at McNeil River was 15,000 chums, marking the fifth consecutive year the river's goal has failed to be met (Appendix Table 25).

Elsewhere in the Kamishak Bay District, no effort specifically targeting chum salmon was known to occur during 1994. By mid-August, aerial surveys began to document fair late chum returns to northern Kamishak Bay systems in Ursus Cove, Cottonwood Bay, and Iniskin Bay Subdistricts. These subdistricts were allowed to remain open to fishing since the building returns were felt to be capable of sustaining low-level harvests without jeopardizing escapements, but again low prices and market demand kept the fleet away. Therefore, entire chum returns were allowed to enter their natal streams as escapement, and most northern Kamishak Bay systems achieved or slightly exceeded their established goals (Appendix Table 25). Turbid water conditions in southern Kamishak Bay, primarily at Big Kamishak River, prevented comprehensive aerial surveying this season, and resulting escapement estimates are considered minimal.

Other Species

Chinook salmon harvests in the Kamishak Bay District historically have been insignificant (Appendix Table 12). On the other hand, coho harvests within the district have at times been substantial, providing fishermen with some lucrative late season catches. Early

indications from other areas within LCI, as well as from adjacent management areas, suggested strong returns. In addition, industry reports as well as reliable spotter pilot updates indicated that significant freshwater escapement of cohos had already occurred in southern Kamishak Bay by the last week of August. Therefore, even though the remainder of the district was to close to all commercial fishing at the end of August, an exception was made in the Kamishak and Douglas River Subdistricts to allow the opportunity to harvest cohos surplus to biological needs. These subdistricts were open to fishing seven days per week from August 29 through September 10. The resulting harvest of 1,900 fish (Appendix Table 17) represents the second highest total since 1989, while escapements, although not monitored as closely as other species, were considered good to excellent.

Outer District

Sockeye Salmon

Outer District sockeye harvests historically have been based on natural returns to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking project in the Port Dick area during the late 1980's provided additional fish for harvest in the early 1990's, but stocking was discontinued after 1989 and a small harvest in 1993 was the last documented catch. Preseason projections forecasted a harvest of up to 25,500 sockeyes for the entire district, but returns were not strong and the actual harvest totalled only 5,900 fish, the fifth lowest total during the past 20 years (Table 3, Appendix Table 13).

Aerial surveys documented sockeyes at both Delight and Desire Lakes beginning in mid-June, but the counts remained low throughout the month. Desire Lake escapement had increased substantially by the last day of June and increased steadily, albeit slowly, over the next two weeks. The slow escapement rate during this period left

some doubt as to whether the goal of 10,000 fish would be achieved since the historical peak usually occurs during early to mid-July. A survey on July 27 documented the season's peak estimate of abundance at nearly 10,500 fish, assuring the goal. Meanwhile at Delight Lake, escapements had increased but the total was still far short of the 10,000 fish goal for that system. In order to protect fish returning to Delight Lake, where escapement continued to lag, yet still provide opportunity to harvest sockeyes excess to escapement needs at Desire Lake, the subdistrict was opened to fishing five days per week only between the latitude of the entrance to James Lagoon and the latitude of the regulatory markers near the Parks Service tent camp beginning July 7. Also, because the escapement goal into Desire Lake had already been achieved, the regulatory markers at the mouth of Desire Lake Creek were not in effect for the five-day-per-week fishery.

Because of the lateness relative to historical run timing, the Nuka Bay opening attracted very little effort. Nonetheless, the open area produced steady but modest sockeye catches until it was closed to fishing on the last day of August, with the late August sockeye catches primarily comprised of incidental harvest during directed pink salmon effort. Total sockeye catch in Nuka Bay Subdistrict for the season was 5,900 fish (Table 3).

Aerial escapement estimates peaked at Delight Lake on July 27, but at 5,600 sockeyes this number represented only slightly over half of the goal for the system. For a second straight year, the relatively dry weather resulted in a nearly complete dewatering of Delight Lake Creek in late July and early August, thus delaying fish entry into the lake and causing them to hold in the freshwater lagoon near tidewater until water levels rose sufficiently near the end of August. The cumulative escapement at Delight Lake was estimated at 5,600 sockeyes, short of the 10,000 fish goal by 44% (Appendix Table 23). At Desire Lake, low water flows were also noted but fish access into the lake was never prevented because of

it. No further buildup or significant influx of fish was observed at Desire Lake after the peak aerial estimate on July 27, with the final estimate of 10,500 sockeyes exceeding the goal of 10,000 fish by 5%.

A third lake system known as Ecstasy (or Delectable) Lakes in East Nuka Subdistrict has been monitored over the last several seasons to document the sockeye return there. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new, formed during the late 1970's and early 1980's by a receding glacier. This fact was substantiated by reviewing charts and maps drawn prior to the mid-1980's, as no lakes are indicated at the site of the present bodies of water.

Prior to the 1980's, no salmon were known to utilize the system, but in approximately 1989, during a routine aerial survey, adult sockeye salmon were documented in the system by the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon as well as pink salmon in the system, with a peak aerial count of 1,300 sockeyes recorded during 1994. Little is known of the origins of this return, however sampling by ADF&G personnel, with help from University of Alaska students on site, was conducted in 1992, 1993, and again in 1994. Otoliths and length measurements indicated primarily large 3-ocean fish (six years old). Additional tissue samples were taken from post-spawning individuals in 1993 and 1994 for inclusion into the genetic baseline data set and future genetic stock identification analysis.

Pink Salmon

Harvest forecasts for pink salmon in the Outer District were moderate, with the largest proportion expected at Port Dick (50,000 fish), followed by Nuka Bay (43,000 fish). The actual harvest of

13,200 pinks (Table 5, Appendix Table 18), taken by 17 vessels, was only 13% of the preseason projection and was the fifth lowest total for the district in the past 20 years.

For the third consecutive season, a management strategy was employed in the Port Dick area based on input from fishermen over the winter of 1991-92. Concerns over fish quality led to a plan whereby the outer areas of the subdistrict would be opened on a calendar date earlier than the traditional opening date (formerly openings were based on stream escapement rates and fish abundance in saltwater). It was hoped that opening areas further away from freshwater systems at an early date would allow the fleet opportunity to harvest higher quality fish before they became freshwater marked, thus increasing their market value. Weak returns to Port Dick in both 1992 and 1993 left the management plan essentially untested going into the 1994 season.

As stated in the Port Dick Management Plan, the South and Outer Sections of the Port Dick Subdistrict opened to fishing for two 40-hour weekly fishing periods, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., beginning on Thursday July 14. At that time, chums were present in Port Dick (head end) Creek and on the nearby saltwater flats, but pinks had not yet begun to show. The North Section of Port Dick Subdistrict remained closed to protect chums returning to streams within that section, primarily Island Creek.

The weak early showing of pinks at Port Dick basically foretold the magnitude of the eventual return, commonly seen during even years. Despite the early opening, very little effort occurred in the subdistrict during the season, with no fish harvested in the Outer Section of the Port Dick Subdistrict and only 1,600 pinks landed in the South Section for the season (Table 5). Final estimated escapement at Port Dick (head end) Creek was 18,100 pinks (Table 5, Appendix Table 24), just short of the lower end of the desired

range of 20,000 to 100,000 fish. The North Section of Port Dick Subdistrict was never opened to fishing in an effort to protect chums returning to Island Creek. This conservative move also served to protect later returning pinks at Island Creek, the only major system of the Outer District to achieve its pink salmon escapement goal with an estimated 28,300 fish (Appendix Table 24).

The effects of extensive logging during recent years in Windy Bay may already be manifesting themselves on fisheries resources there. Escapements into systems at Windy Bay were dismal, with estimates of 3,000 and 2,200 pinks, respectively, for Windy Left Creek and Windy Right Creek (Appendix Table 24), far short of the goals of 30,000 to 50,000 pinks for the former and 10,000 for the latter. After the first survey of the Windy Left stream this season on August 11, the ground survey crew reported substantial numbers of "blowdown" trees in the stream channel. High winds apparently caused many of the uncut trees in the riparian buffer strip to fall across the creek. Subsequent aerial and ground surveys documented sections within the lower half mile of the Windy Bay Left stream criss-crossed with blown down trees from the "prescribed" buffer zones. The limited (66-foot) leave strips were obviously not wide enough in this Outer Gulf coastal area to prevent damage caused by commonly high winds (hence the local name) or preclude the subsequent "domino effect" from blowdowns.

Many of the downed trees within the stream channel appeared to be creating reduced stream flows and siltation in prime pink salmon spawning areas, potentially leading to adverse increases in stream temperatures and long-term spawning habitat degradation. Negative impacts on pink salmon spawning success for the 1994 brood year appeared likely as a result. In fact, the poor pink salmon return to the Windy Bay drainages in 1994 may have already reflected the beginning of serious problems for the stocks utilizing these two systems.

At Nuka Island, pink salmon first appeared in fresh and salt water at South Nuka Island Creek in a brief "burst" during the last week of July, but the numbers never grew and escapement was a disappointing 1,400 pinks (Appendix Table 24). At Rocky River, where the desired escapement is 50,000 pinks, the return amounted to just over 17,000 fish (Table 5, Appendix Table 24). Port Chatham escapements were estimated at 3,300 pinks, far short of the 10,000 to 15,000 fish range for the systems there. No commercial openings were allowed at any of the aforementioned areas due to the weak returns.

An unexpectedly strong pink return to Desire Lake Creek in the East Arm of Nuka Bay produced moderate incidental catches in August during effort primarily directed at sockeyes. Two days of increased pink catches very late in August brought the total pink harvest in East Nuka Bay Subdistrict to 13,200 fish (Table 5).

Chum Salmon

Chum salmon numbers have experienced dramatic declines in the Outer District since the peak harvest years of the late 1970's and early 1980's. Large returns were once again not expected in 1994 due to a succession of poor returns over the past several seasons. No specific commercial openings targeting chum salmon occurred in 1994, and the harvest of 32 incidentally caught fish (Appendix Table 21) was the lowest ever recorded since statehood in this district.

Escapements into the three monitored chum salmon systems in the Outer District were fair to poor with all three failing to achieve their goals. Port Dick (Head End) Creek fell short of its 4,000 chum escapement goal by 500 fish (Appendix Table 25). Island Creek chum escapement totalled 8,800 fish, 12% shy of the lower end of

the escapement goal range of 10,000 to 15,000 fish, while Rocky River escapement totalled 1,900 chum salmon in the escapement, well short of the goal of 20,000 fish.

Eastern District

Sockeye Salmon

The Eastern District had potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Bay Subdistricts during 1994, with a district-wide preseason projection of up to 24,000 fish. However, the actual total catch amounted to 9,700 sockeyes (Appendix Table 13), short of the forecast but still the highest total since 1988. Over 80% of this total, however, was taken as hatchery cost recovery at the Bear Lake weir (Table 1).

At Bear Lake, near Seward in the Resurrection Bay Subdistrict, sockeye enhancement activities by CIAA fostered optimism for a total return ranging from 10,000 to as high as 93,000 fish assuming optimum survival of various smolt releases. Based upon the expected long-term increase of sockeyes returning to this system, a Resurrection Bay Management Plan was drafted during the winter of 1991-92. This plan allows the seine fleet opportunity to begin fishing on the Bear Lake sockeye run at a relatively early date in the outer reaches of Resurrection Bay in order to promote product quality. This season, in keeping with the plan, the entire Resurrection Bay Subdistrict, up to a point one mile due south of Cape Resurrection and Aialik Cape, was opened to seining by emergency order on a schedule of two 40-hour fishing periods per week, beginning on Monday, May 9. Despite presumption of an early run timing for this enhanced run (since brood stock from Big River in Upper Cook Inlet had a documented run timing peaking in early June), the first two years of adult returns in 1992 and 1993

actually trickled in over the course of two months, creating concern that future returns would perform quite differently than originally intended.

When the area first opened in 1994, no effort occurred in the outer areas of the subdistrict as the fleet once again adopted a "wait-and-see" attitude, hoping to locate fish nearer to the head of the bay before assessing run strength. After the disappointing returns during 1992 and 1993, fishermen were reluctant to invest much time prospecting without some indication that the run would actually materialize. Eventually, three landings were made on June 14, followed by two more on June 21 and 23. The total Resurrection Bay purse seine catch amounted to 1,000 sockeyes (Table 3), well short of preseason expectations once again.

The sockeye run to Bear Lake was stronger than in recent years but still weaker than hoped for based on enhancement releases into the lake. Counts at the Bear Creek Weir facility, operated by CIAA, amounted to 8,600 fish for escapement (Appendix Table 23), the highest total since 1969, plus an additional 8,100 fish taken for hatchery cost recovery (Table 1). As was the case during the previous two seasons, sockeye escapement was rather protracted, beginning at the end of May and continuing into early August.

At Aialik Lake in the Aialik Subdistrict, aerial surveys were begun on June 16, but the first sockeyes were not observed until June 30 with an estimate of 450. Subsequent flights over the next three weeks revealed only a minor increase, suggesting a dismal return. Waters of the subdistrict, excluding those of Aialik Lagoon, were opened to seining July 12 on two 48-hour periods per week in an effort to gain information on run strength without jeopardizing those fish already in the lagoon. Despite the opening, only two landings totalling 200 sockeyes were made during the month of July, indicating the return was indeed weak and/or late. Finally, on July 28, nearly one month after sockeyes were first documented, a

survey estimated 2,500 sockeyes in Aialik Lake, achieving the escapement goal of 2,500 to 5,000 fish. The season's commercial harvest totalled just over 600 sockeye in Aialik Subdistrict (Table 3), the majority of which were incidentally taken while targeting pink salmon in August. A final late-season aerial survey of Aialik Lake in mid-August boosted the escapement estimate to a surprising 7,300 sockeyes (Appendix Table 23), which apparently entered the system well after the normal historical peak of the run timing.

Pink Salmon

No harvest of pink salmon was forecasted for the Eastern District during 1994 due to weak returns in recent years. Limited ground surveys of Resurrection Bay systems in early August reflected the presence of pinks in virtually all streams but in numbers insufficient to sustain a commercial harvest. Therefore, the Resurrection Bay Subdistrict remained closed to fishing for pinks.

Despite the weak show of pinks early in the season, on-grounds stream surveys showed a late surge of pinks that boosted escapements and achieved desired goals at all major systems in Resurrection Bay. At Bear and Salmon Creeks, where the combined pink escapement goal is 15,000 fish, a total of nearly 35,000 pinks was estimated (Appendix Table 24). The figure for Thumb Cove was estimated at nearly 11,000 pinks, while at Humpy Cove 2,200 fish were estimated. Tonsina Creek produced an estimate of 7,000 pinks.

Aialik Subdistrict, originally opened to two 48-hour fishing periods on July 12 for sockeye salmon, was never closed after the sockeye run was effectively over. A number of vessels travelled to this open district later in the season in hopes of fishing the outer areas for pink salmon as had been successfully done during the past three seasons. During those years, the fishery was allowed to continue despite knowledge that the targeted fish were

bound for Prince William Sound. The staff elected to leave the area open again in 1994 because the relatively modest catches did not threaten either local or non-local stocks.

The first landing of pink salmon in Aialik Bay occurred on July 25, which was early by historical standards. The catch totalled over 1,000 fish, relatively strong for the early date. Fishing continued throughout the month of August, with a peak single day catch of 10,700 pinks on August 16 taken by five vessels. Total harvest for the season in Aialik Subdistrict was 45,000 pinks (Table 5).

Other Species

Chum salmon are the only other commercially important species in the Eastern District, but harvests during the previous five years have been dismal. This season's chum harvest amounted to 2,800 fish (Table 6, Appendix Table 21), the highest since 1988. However, nearly all of these fish were taken in early July in Resurrection Bay during an open period intended for the harvest of sockeye salmon returning to Bear Lake. The fish were intentionally harvested near the mouth of Tonsina Creek without regard for fish quality and before the staff had assessed chum escapements. The subdistrict was closed almost immediately after this harvest to protect remaining chums as well as pink salmon just starting to return. It is worthwhile noting that the majority of chums harvested in Resurrection Bay were ultimately sold as bait for excessively low prices due to freshwater marking and poor quality.

Coho salmon are not normally a commercially important species in the Eastern District. However, the 10,400 cohos harvested in 1994 (Appendix Table 9) represent the highest total ever recorded for the district. Just under 50% of the total was hatchery cost recovery at the Bear Lake weir, with the remainder taken

incidentally during the pink salmon fishery in Aialik Bay. The large harvest reflects the strong nature of the coho returns to nearly all area streams.

SUBSISTENCE AND PERSONAL USE FISHERIES

Kachemak Bay Subsistence Fishery

The Southern District (Kachemak Bay) fall coho salmon gillnet fishery dates back prior to statehood under varying names, being known as a "personal use" fishery during the years 1986-1990 and 1993, and as a "subsistence" fishery in 1991 and 1992. Numerous court rulings have affected the status of this fishery over the past 15 years. Board of Fisheries actions during the fall 1992 meeting resulted in the elimination of the subsistence fishery for the Homer area and creation of a personal use gillnet fishery, which was prosecuted in 1993. However, after that fishery had already occurred, the Alaska Superior Court ruled that the Board's creation of "subsistence" and "non-subsistence" areas was unconstitutional. The Alaska Supreme Court subsequently issued a stay of the earlier ruling, but in April of 1994, the higher court ended its stay of the Superior Court ruling, thus rendering all non-subsistence areas previously established by the Alaska Board of Fisheries unconstitutional and thereby voiding the local "personal use" fishery. The Board responded to this court action by directing the Commissioner of the Department of Fish and Game to draft emergency regulations governing fisheries which formerly occurred in the non-subsistence areas. These emergency regulations were subsequently adopted as permanent regulations and effectively returned the fishery to a "subsistence" status in 1994.

The target species in the Kachemak Bay gillnet fishery has been coho salmon, with returning fish a mixture of natural stocks bound

primarily for the Fox River drainage at the head of Kachemak Bay and enhanced runs bound for the Homer Spit fishing lagoon and Fox Creek near the head of Kachemak Bay. The regulations governing the fishery are found in the Southern District Coho Salmon Subsistence Fishery Management Plan, which directs the Department of Fish and Game to close the fishery when an estimated 2,500 to 3,500 coho salmon are harvested. This amount was determined by the Board to be appropriate after reviewing historical harvests in years prior to enhancement.

All regulations which had applied to the 1993 personal use fishery remained essentially unchanged for the 1994 subsistence fishery. The regulatory opening date for the fishery was August 16. Legal gear was limited to a single set gillnet not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches in mesh size. Nets were not permitted more than 500 feet from the mean high water mark, and a net could not be set offshore of another net. A permit from the Homer office was required, with proof of residency necessary to obtain a permit. The seasonal limit was 25 salmon per head of household and 10 additional salmon per each dependent. There were two 48-hour scheduled fishing periods each week, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m.

The regulatory opening date of August 16 fell on a Tuesday during 1994, which was the middle of the regularly scheduled weekly fishing period. If allowed to open by regulation, the fishery would have begun at 12:01 a.m., during darkness. Because the staff felt that such an opening would cause difficulty for participants in determining minimum distances between nets, and would also make enforcement impractical, the opening was delayed by Emergency Order (E.O.) No. 2-F-H-022-94 until 6:00 a.m. August 16 (Table 8).

The number of personal use permits issued for the 1994 fishery (286) was the lowest since 1977 (Appendix Table 26), continuing the

downward trend observed over the past four years. Prior to the opening on August 16, the Department requested voluntary daily reporting from each permit holder, and these voluntary inseason catch reports, combined with experience from previous years' fisheries, suggested that the lower end of the harvest range would be achieved by the end of the second regularly scheduled 48-hour fishing period. The closure was announced to coincide with the end of this period on August 20. A total of 72 hours fishing time was allowed, making the 1994 fishery the shortest on record, surpassing the previously shortest fishery of 87 hours actual fishing time recorded in 1991. Catch figures based on 284 permit holders reporting (99% of the total) were as follows: 4,097 cohos; 1,178 pinks; 80 sockeyes; 18 chums; and 66 chinooks (Appendix Table 26). The 1994 coho catch represents the second highest total since the fishery has been intensely managed for the guideline harvest range during the past four years.

Actual fishing effort in the 1994 fishery was nearly identical to that of 1993 but slightly more than half of the peak 1990 level (Appendix Table 26). The major factor which led to the short duration of the fishery and a coho catch exceeding the upper end of the guideline harvest level was the strength of the return. Because coho assessment is limited in LCI, sport and commercial catches are normally utilized as indicators of run strength. Unfortunately, commercial catches in LCI did not accurately reflect the strength of the 1994 coho return due to a lack of directed effort. Informal observations in the local sport fisheries, however, as well as reports from adjacent management areas, suggested very strong, and perhaps slightly early, returns. This information, along with catch rates from the first 24-hour fishing period, led the staff to project that a harvest approaching the upper end of the guideline range would be achieved by the end of the second (48-hour) fishing period.

Although the guideline level was exceeded by about 600 fish, the staff felt confident that the short duration of the fishery afforded an extra measure of protection to wild stocks of coho salmon. Allowing additional gillnet fishing time could have easily resulted in an unacceptably high harvest rate on the natural returns in spite of the strong returns. Aerial surveys to assess coho escapement in the Fox River drainage were prevented through much of September by poor weather and heavy rainfall. When a survey was finally conducted on September 30, the numbers of coho documented were very low (less than 200 fish) by historical standards in Clearwater Slough (Table 4), a major coho salmon spawning tributary used as a coho "index" stream in the Southern District. It is difficult to categorize these low numbers when compared to historical escapements since the only survey this year occurred late in the season, past the normal "peak" time for assessment.

Enhancement efforts in Kachemak Bay continue to have a significant impact on the subsistence gillnet fishery. Coho salmon produced from hatchery stocking projects have changed the nature of the fishery by shifting the areas considered most productive and consequently altering the intensity of effort in these areas. Returns from enhancement projects have made substantial contributions to the subsistence gillnet harvests, particularly in the vicinity of the Homer Spit. Without the contribution of enhanced fish to the catches, the subsistence fishery would undoubtedly become more prolonged and therefore more similar to historical fisheries prior to enhancement. Prior to 1991, the fishery was generally allowed to proceed from the regulatory opening on August 15 until the regulatory closure on September 15. Most participants would have ample opportunity to set their nets over this month-long time period. It followed, then, that run timing in any given year had little effect on catches since effort could be arranged around the peak of the run. In recent years, however, intense competition for this resource has concentrated

effort, and the subsequent harvest, at the start of the season. This has been most notable in the Homer Spit area due to the easy access and the attraction of the hatchery-stocked fish. As a result, catches over the past three seasons have approached the guideline harvest range within the first week after opening, effectively eliminating those fishermen who either are unable to fish during the opening week or who simply fail to secure a fishing site during that week. Additionally, for fishermen whose catches are comprised primarily of natural stocks, such as those fishing the south side of Kachemak Bay, a short season coupled with late run timing, as occurred in 1992 and 1993, may mean very few cohos in their catches.

The 1994 fishery once again demonstrated the extreme popularity of the east side of the Homer Spit as the most sought after fishing area, undeniably due to the coho enhancement project at the Homer Spit "fishing lagoon". Prior to enhancement, the Spit was only considered average in terms of harvest productivity. The Spit's easy road access and the enhanced coho return have combined to encourage fishermen to clamor for fishing sites on the Spit, a situation which resulted in numerous violations during previous gillnet fisheries. As in recent years, the staff made a concerted effort prior to the first opening to inform the public of the short duration of the fishery and of the potential for violations in areas of heavy effort, primarily the Homer Spit. Despite the presence of Fish and Wildlife Protection officers, a total of 14 citations was issued, primarily for violation of the minimum distance between units of gear. The officers reported a "100% violation rate" on the Spit, i.e. virtually every net they encountered was in violation.

These violations highlight a persistent problem encountered in the subsistence fishery since coho returns to the Homer Spit enhancement lagoon have increased to their present levels. Numerous convictions and/or guilty pleas resulting from the

citations issued during the 1994 fishery could act to curb the violation rate in the future, but participation is expected to remain strong in this popular Kachemak Bay fishery and fishermen will undoubtedly continue to compete intensely for the most productive fishing sites.

Nanwalek/Port Graham Subsistence Fishery

The only other subsistence fishery presently in LCI occurs near the villages of Nanwalek (formerly English Bay) and Port Graham, located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). Most fishing occurs within close proximity to the respective villages and targets sockeye salmon returning to the English Bay Lakes system. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about seven nautical miles south of English Bay, targeting non-local stocks of chinook salmon as well as local stocks of chum salmon.

The sockeye salmon run to English Bay Lakes has been severely depressed for much of the last decade, with returns failing to achieve the minimum escapement goal for nine consecutive years between 1985 and 1993. As a result, the Port Graham Subdistrict, which includes both Port Graham and the English Bay Section, was closed again in 1994 to commercial, sport, and subsistence fishing beginning June 6 to protect returning sockeye adults. These areas remained closed to fishing until July 18, when the sockeye run was effectively over, at which time the sport and subsistence fisheries were reopened. The final 1994 escapement estimate for English Bay Lakes, obtained from a counting weir on English Bay River operated by Chugach Regional Resources Commission, was 13,800 sockeyes (Appendix Table 23), achieving the minimum established goal of 10,000 fish for the first time since 1984 and the highest total since 1982.

Closures of the Port Graham and English Bay areas to subsistence fishing resulted in significantly reduced catches of sockeye salmon at Port Graham compared to historical averages (Appendix Table 28). This reduction was mitigated by above average catches of all other species. Interestingly, subsistence fishing success for residents of Nanwalek was considerably greater than that of Port Graham for sockeyes and pinks but poorer for the other three species (Appendix Table 29).

ENHANCEMENT AND REHABILITATION

Introduction

Fisheries enhancement has played a major role in LCI salmon production during recent years. Natural adult salmon returns to the LCI area continue to demonstrate wide fluctuations, often the result of environmental impacts such as flooding or ice scouring on spawning grounds. Since their inception in the mid-1970's, enhancement and rehabilitation projects have made significant contributions to both commercial and sport fishing harvests. These contributions have historically ranged from 24% to 90% of the entire LCI commercial salmon harvest and are expected to remain high in future years.

Projects initiated by the former FRED Division and CIAA provided an estimated 92% (1,648,700 salmon) of the total 1994 LCI commercial harvest of 1,784,700 fish. The Leisure/Hazel, Kirschner, Bear, and Bruin Lakes sockeye salmon enhancement projects produced approximately 79% (91,400 fish) of the total LCI sockeye harvest of 115,400 fish in 1994. Tutka Lagoon Hatchery production, along with the ADF&G/CIAA/CISA cooperative rearing and remote release project at Halibut Cove Lagoon, accounted for nearly 95% (1,557,300 fish) of the 1994 LCI commercial pink salmon harvest of 1,647,900 fish.

Using average weights per fish and average prices per pound in LCI, the estimated contribution of ADF&G/CIAA-produced salmon was 69% ($948,200) of the $1.382 million total value of the 1994 LCI commercial salmon harvest. About 36% ($498,200) of the total exvessel value of the fishery was utilized for hatchery cost recovery purposes (Table 7). A brief description of the current enhancement projects in LCI follows.

Tutka Lagoon Hatchery

The Tutka Lagoon Salmon Hatchery/Rearing Facility was constructed in 1976 with an initial production capacity of 10 million salmon eggs, but expansion over time, including recent work during the winter of 1993-94, has increased it's capacity to the present level of approximately 100 million eggs. Pink salmon have been the primary species produced at the hatchery, while secondary chum enhancement has been discontinued in favor of recent efforts directed toward sockeye salmon. Presently the hatchery has a sockeye egg capacity of 1.8 million eggs, while raceways are also in place to accommodate the resulting fry.

In 1994 the adult pink salmon produced by Tutka Lagoon Hatchery totalled approximately 1,628,000 fish returning to the hatchery only (Table 9). No attempt has been made to separate the contribution resulting from natural spawning in Tutka Creek. The estimated 3.8% overall survival rate was slightly greater than the facility's historical average. The commercial harvest, including cost recovery, of 1,451,700 pink salmon from Tutka Bay and Lagoon (Table 9), accounted for approximately 91% of the pink salmon landed in the Southern District and 88% of the entire LCI commercial pink salmon harvest. Pinks taken for hatchery cost recovery purposes from the Tutka Bay Subdistrict totalled 953,400 fish, worth approximately $412,900. This was still $54,600 short

of CIAA's revenue goal of $467,500. Approximately 61.0 million short-term reared pink salmon fry were released into Tutka Bay in 1994.

Leisure and Hazel Lakes Sockeye Salmon Stocking

Leisure Lake, also called China Poot Lake, historically was a system barren of sockeye salmon. A study initiated in 1976 involved the stocking of hatchery-produced sockeye salmon fry to determine optimum stocking levels prior to and after lake enrichment through fertilization. Because a barrier falls below the lake prevents upstream migration, and therefore precludes any adult spawning, it is desirable to harvest all returning adult fish in the terminal harvest area, China Poot Bay. A similar sockeye stocking program was initiated at Hazel Lake, which empties into Neptune Bay and is located approximately three miles south of Leisure Lake, beginning in 1988. Since the initiation of these projects, about 1.0 million adult sockeyes are estimated to have returned as a result of the stocking programs (Appendix Table 15), making a significant contribution to the commercial and sport sockeye harvests in the Southern District.

Because of the close proximity of the two terminal harvest areas, and the absence of a mark/recovery program, adult returns to Leisure and Hazel Lakes cannot be separately identified through sampling within the commercial catches and are therefore presented as a combined total. The total combined sockeye return to Leisure and Hazel Lakes in 1994 was estimated to be 59,900 fish (Figure 5, Appendix Table 15), slightly above the (all-years) average since 1979 but considerably below the recent 10-year average (which only included returns to Leisure Lake during the years 1984 through 1990). The cumulative commercial harvest of 50,500 fish comprised over three-fourths of the Southern District sockeye harvest and 44% of the total LCI sockeye salmon harvest.

No sockeye salmon fry were released into Leisure Lake in 1994 for the first time since 1976, also ending a ten-consecutive-year run of high-density stocking (Appendix Table 30). Similarly, no fry were released into Hazel Lake for the first time since 1987. Due to an outbreak of the IHNV at the Crooked Creek Hatchery, nearly all rearing sockeye fry at the facility had to be destroyed and none were available for stocking at these two sites.

Halibut Cove Lagoon Salmon Enhancement

Pink Salmon

Pink salmon enhancement at Halibut Cove Lagoon was initiated in 1986 as a cooperative program between CISA, CIAA, and ADF&G. Pink salmon fry were transported from Tutka Hatchery to Halibut Cove Lagoon where they were held in floating net pens and fed for 30 days before release. The goal of this project was to disperse fry releases from the Tutka Hatchery over more underutilized rearing areas. It also served to disperse the commercial seine fleet over larger areas. Since there is no suitable spawning habitat available at Halibut Cove Lagoon, all returning adult fish were targeted for harvest in the commercial seine and set gillnet fisheries.

The 1994 adult return from the 1993 release of six million pink salmon fry was estimated at 105,600 fish (Table 9), representing a survival rate of approximately 1.8%. Previous tagging studies have shown that up to 15% of the fry released from Halibut Cove may have imprinted and returned to Tutka Creek, the original parent stream. The reasons for this year's relatively poor pink salmon survival are unknown, but the 1994 return was disappointing considering that past ocean survival rates exhibited by adults returning to this site have approached 10%. In addition, the survival rate experienced at Halibut Cove Lagoon was less than half that of this

year's pink return to Tutka Bay Hatchery. For the first time since 1985, no pink salmon fry were released into Halibut Cove Lagoon during 1994.

Chinook Salmon

The chinook salmon enhancement project at Halibut Cove Lagoon involves the release of chinook salmon smolts, with the objective of increasing sport fishing opportunities in Kachemak Bay. This is the oldest and one of the most popular sport fishing enhancement projects in LCI. An estimated 2,500 adult chinook salmon returned to Halibut Cove Lagoon in 1994.

Although adult returns from the Halibut Cove Lagoon stocking program are not intended for commercial harvest, there is incidental harvest of these chinook salmon in the commercial set gillnet and seine fisheries. In 1994 the incidental harvest by commercial fishermen was estimated at 500 fish, or about 20% of the total return, less than the estimated long-term average of about 34%. The majority of the 1994 catch was taken by set gillnetters at about 82%, while seiners harvested the remaining 18%. The bulk of the seine catch of chinooks was taken after July 5, when the commercial fishery (targeting pink salmon) opened in Halibut Cove Lagoon. This terminal pink salmon fishery occurs near the end of the chinook return, after most sport angling effort for chinooks has shifted to more productive areas. A significant number of the commercially harvested chinook are small 2-ocean fish, which probably would not have been harvested by anglers and cannot spawn at Halibut Cove Lagoon due to a lack of suitable spawning habitat.

Chenik Lake Sockeye Salmon Stocking

Chenik Lake, located in Kamishak Bay, historically was an excellent sockeye producer prior to the 1940's when annual runs approached 150,000 fish. Since that time, however, sockeye runs declined

dramatically, forcing a complete closure of the Chenik area fishery beginning in 1952. By the mid-70's the annual return to this system was less than 500 fish.

In 1978 the former FRED Division initiated a program to re-establish the sockeye returns and subsequently increase commercial fishing opportunities in the Kamishak Bay area. Sockeye fry from Crooked Creek Hatchery have been annually stocked in Chenik Lake since that time, and a fish pass was developed at the intertidal mouth of Chenik Creek, alleviating a partial migrational barrier. Since 1987, lake enrichment has occurred through the application of liquid fertilizer, but not on an annual basis.

Increased sockeye escapements in the early 1980's augmented subsequent production, and the Chenik area was reopened to commercial fishing. Returns have produced up to 50% of the total LCI commercial sockeye harvest in some recent years, approaching the historical record high runs of the 1930's.

The 1994 sockeye return to Chenik Lake was a complete failure, with no commercial harvest and a documented escapement of only 800 adults (Figure 6, Appendix Table 16). The primary reason for the low return, which was expected but not nearly at the magnitude experienced this year, was the detection of Infectious Hematopoietic Necrosis Virus (IHNV), a disease commonly affecting juvenile salmon and trout. IHNV was documented in the Chenik system during the 1991, 1992, and 1993 smolt outmigrations. It is suspected of causing increased mortality to juvenile sockeyes and therefore reducing the adult returns. A thorough investigation of the relationship between the Chenik Lake sockeye stocking project and the IHNV problem was initiated during the winter of 1992-93, ultimately resulting in a staff recommendation to reduce fry stocking densities from peak levels occurring in 1989 and 1990.

The outmigration of sockeye smolts at Chenik Lake has been monitored in recent years through use of a weir and live trap. Total outmigration in 1994 was 22,800 smolts, still low but an improvement over the 14,000 smolts counted in 1993. Additionally, in contrast to the past three years, outmigrating smolts showed negligible signs of the IHN virus, perhaps signalling the first phase of this system's recovery.

The factors relating to IHNV epizootics are very complex and currently not well understood. Although remotely possible that the stocked sockeye salmon fry were the source of the virus, a more likely cause is that Chenik Lake has become a reservoir for IHNV released from the sex products of naturally spawning adult sockeyes or their decomposing carcasses. It has been hypothesized that the tremendous population declines experienced by the sockeye stock at Chenik Lake in the late 1930's and 1940's may have resulted from IHNV epizootics caused by record high escapements of up to 53,000 adults in the 1930's.

Unfortunately, there is no known practical onsite treatment of IHNV other than perhaps decreasing fry stocking densities, which was begun in 1993 with a reduction to just over one million sockeye fry (Appendix Table 30). This experiment was inadvertently stretched to its maximum limit by default in 1994 when no hatchery-produced fish were released into the system. The fry from Crooked Creek Hatchery which were slated for stocking at Chenik Lake were destroyed due to an outbreak of the IHN virus at the hatchery facility. It should be noted that this was the first documented incidence of IHNV at the Crooked Creek facility in 22 years of operation.

Cutting back the adult escapement should also theoretically decrease transmission of IHNV into the littoral zone of Chenik Lake. Adult escapement into Chenik Lake, once again enumerated through the use of a counting weir at the lake outlet in 1994,

totalled only 800 fish, far short of the 10,000 fish goal (Appendix Table 23). The escapement shortfall, when combined with the lack of supplemental stocking, equates to little or no production from the lake during 1994 and reduced production in 1995, assuming normal stocking resumes then.

The Department and CIAA are currently reviewing future stocking levels and potential for further fertilization of Chenik Lake. It is anticipated that the numbers of returning adult sockeye will remain depressed in upcoming years because of the IHNV problem within the system.

English Bay Sockeye Salmon Rehabilitation

The English Bay Lake system has the only significant natural run of sockeye salmon in the Southern District of LCI. Unfortunately, the English Bay sockeye returns declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye escapements since 1985 have ranged from 2,500 to 8,900 fish; all but one of these years (1993) was well below the 20-year average of 7,800 fish (Appendix Table 23). The 1994 escapement, tallied once again through the use of a counting weir operated by Chugach Regional Resources Commission, totalled 13,800 fish. This was the highest return since 1982 and the first year since 1984 in which the desired goal of 10,000 fish was achieved. Optimum escapement for this system is estimated at 15,000 to 20,000 sockeyes.

The decline of the English Bay sockeye run has resulted in a very restrictive management strategy for this area. The commercial, sport, and subsistence fisheries have been closed for most of the last several seasons. Efforts to rehabilitate this depressed stock were initiated by the former FRED Division with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990. Chugach Regional Resources Commission, in cooperation with the village of Nanwalek (formerly English Bay) and the Bureau of Indian

Affairs, has since taken over this enhancement project and continued egg collections, fry stockings, and operation of a smolt/adult enumeration weir. During 1994, approximately 800,000 sockeye fry (Appendix Table 30) were released into one of the larger lakes in October after a long-term pen rearing production project. An estimated 927,000 sockeye eggs were collected in 1994 for incubation at Port Graham Hatchery during the winter of 1994-95, however a problem with the egg counting machine forced the calculation of egg numbers via a weight conversion, therefore the numbers presented are not verified.

Bear Lake Sockeye Salmon Enhancement

Bear Lake, located at the head of Resurrection Bay in the Eastern District, has been the target of sockeye salmon enhancement efforts over recent years. This system has been the centerpiece of a Division of Sport Fish coho salmon enhancement program since 1962, part of which included limiting the escapement of sockeye salmon into the lake. As a result, only a small remnant run of naturally spawning sockeye salmon remained at Bear Lake. In an effort to produce increasing numbers of adult sockeyes without adversely affecting coho salmon production, as mandated by Board of Fisheries policy, CIAA undertook a sockeye stocking program beginning in 1989 with the release of 2.2 million sockeye fingerlings. Since then, additional releases of both fingerlings and accelerated growth ("zero check") smolts have occurred, ranging from 1.6 to 2.4 million juvenile sockeye salmon each year (Appendix Table 30). The first year of adult returns in 1992 was discouraging, with a total of less than 2,000 fish, however this return was primarily based on the survival of the "zero check" smolts. Although the 1993 return was expected to be better because of contributions from both fry and smolt plants, the entire return totalled only 6,700 sockeyes, another major disappointment. In 1994, a total of 17,600 adult sockeyes returned to Resurrection Bay as a result of Bear Lake enhancement (Table 3), an improvement over the previous two years

but still considered discouraging based on stocking levels. Reasons for the low returns are unclear at this time. Approximately 170,000 sockeye fry were released into Bear Lake during 1994 (Appendix Table 30), while 530,000 sockeye eggs were colected for incubation at the Trail Lakes Hatchery in Moose Pass.

Other Sockeye Salmon Lake Stocking

Only one LCI lake was stocked in 1994 with sockeye salmon fry produced by Crooked Creek Hatchery due to the IHN outbreak at the facility which forced the destruction of all but 300,000 fish. This number was released into Kirschner Lake in the Kamishak Bay District (Appendix Table 30). Four other lakes, evaluated through pre-stocking studies conducted between 1986 and 1989, and which have been regularly stocked during recent years, received no sockeye fry during 1994. The four lakes included Bruin Lake, Ursus Lake, Upper Paint Lake, and Lower Paint Lake, all in the Kamishak Bay District.

The fifth year of adult sockeye returns to Kirschner Lake occurred in 1994. The total return to Kirschner Lake was nearly 31,300 sockeyes (Table 3), achieving the preseason forecast for that system. Up to 5,000 fish (as second year returns) were expected at Bruin Lake as a result of lake stocking initiated in 1990, with the final 1994 estimated return approaching the forecast. These fish are prevented from reaching the lake by a barrier falls in Bruin Lake Creek.

Paint River Fish Pass

The Paint River system in the Kamishak Bay District contains at least 40 kilometers (25 miles) of potential salmonid spawning and rearing habitat. Currently the Paint River system is barren of salmon because of a waterfall at tide line that was impassable prior to 1993. The former FRED Division and CIAA initiated

feasibility studies for a fishway in 1979. CIAA received State and Federal grant funds to build the fishway, completing construction in the fall of 1991. ADF&G Commissioner Carl Rosier declared the fish pass officially operational in January 1993.

The Paint River Lakes were first stocked with sockeye fry in 1986 and annually since 1988 to test the feasibility of developing a sockeye salmon return to the fish pass project site. Again due to the unavailabilty of sockeye fry from Crooked Creek Hatchery, no fry were released into the two Paint Lakes in 1994 (Appendix Table 30).

A peak of 550 adult sockeyes was observed during aerial surveys of the Paint River mouth and Akjemguiga Cove during 1994, the fourth consecutive year of meager returns to this enhancement site. Because of the small numbers of returning fish, the fish pass was not opened to the migrating salmon and no freshwater escapement occurred.

Port Graham Hatchery

In an effort to supplement natural fish production and provide increased employment opportunities in the native village of Port Graham, the Port Graham Hatchery Corporation applied for and received a permit to operate a private non-profit (PNP) hatchery in 1992. Port Graham is located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). The hatchery had conducted experimental egg-takes and fry releases via a scientific/educational permit from 1990 through 1992, while these activities have since been permitted in the Port Graham Basic and Annual Management Plans. Adult returns to the hatchery failed to appear in both 1992 and 1993 despite predictions of at least moderate returns. Because no fry were released in 1993, both the forecast and actual return for 1994 were zero.

Although all efforts prior to 1993 were directed towards pink salmon, sockeye salmon production is now underway at the Port Graham Hatchery. The facility incubated sockeye salmon eggs collected from English Bay Lakes, destined for release back into that system, during both 1993 and 1994. Formerly eggs from this collection site were incubated at Big Lake Hatchery near Wasilla.

The PNP permit allows pink salmon brood stock collection from a natural run in the Port Graham River, at the head of Port Graham. However, the Port Graham River pink run historically has experienced significant natural fluctuations in escapements despite conservative fishing schedules, causing some concern over protection of the natural stocks. Consistent with the priority of managing for natural stocks (**AS 16.05.730**), a brood stock collection schedule based on the desired natural escapement into Port Graham River as well as historical escapement levels has been devised to offer maximum protection to the wild pink salmon stock during years of weak returns. In 1994, the hatchery collected only 700 pinks for brood stock purposes (Table 5) due to the relatively weak natural return to Port Graham River.

Harvest of returning hatchery stocks could potentially occur in commercial purse seine and set gillnet fisheries as well as a subsistence set gillnet fishery in Port Graham. Hatchery fish will likely intermix with wild stocks bound for the Port Graham River. Management decisions must address the effects of these various fisheries so as to afford protection to the natural stocks until adequate escapement into Port Graham River is achieved. A small natural return of chum salmon to Port Graham River also occurs, and this run has been depressed in recent years, so management measures must strive to protect this species as well.

The approved Port Graham Hatchery Basic Management Plan designated a Special Harvest Area (SHA) to allow for brood stock collection and cost recovery harvest (Figure 8). The SHA was designed to

provide a migration corridor on the northeast side of the bay for wild stocks traveling to Port Graham River at the head of the bay. Restricting the harvest in Port Graham to the SHA is expected to afford some limited protection to the natural spawning stocks of pink and chum salmon. Once hatchery brood stock and cost recovery requirements are met, remaining surpluses may be harvested by the common property fishery inside the SHA. However, no guarantee of brood stock and/or cost recovery can be assumed. Fishing time will have to be restricted until the fish become spatially segregated or until adequate escapements are achieved in the river.

1995 COMMERCIAL SALMON FISHERY OUTLOOK

Sockeye Salmon

Adult sockeye salmon returns to all LCI systems could approach 254,000 fish in 1995, nearly two-thirds of which (163,000 fish) should be a result of the continuing enhancement and lake stocking projects in LCI. Beneficial results of Leisure Lake fertilization should again be evident in the 1995 sockeye returns. Based on past emigration and survival estimates from annual releases of two million fry, approximately 65,000 sockeye salmon are projected to return to China Poot Bay in 1995. An additional 45,000 sockeyes are expected to return to Neptune Bay as a result of fry releases into Hazel Lake. Caution must be used when evaluating these forecasts however, as the adult returns to these two locations in 1994 were less than half the preseason projections despite similarly optimistic expectations.

No harvest is expected to occur at Chenik Lake in 1995. Despite parent brood year escapements at or near desired levels, and annual stocking of up to 2.75 million sockeye fry, an epizootic of IHNV apparently has caused significant mortality to juvenile sockeyes and reduced the numbers of emigrating smolt from the system in

recent years. The 1994 adult return may well have displayed the most significant effects of the IHN outbreak as only 800 fish were tallied past the weir at Chenik Lake. Smolt outmigration data suggests that the 1995 return could be equally as poor.

Adult sockeye returns to Kirschner Lake have been very encouraging over the past three seasons, leading to a forecast of 30,000 fish in 1994. Bruin Lake, also in the Kamishak Bay District, has been stocked with sockeye fry since 1990, but the resulting third year adult return is only expected to total 6,500 fish in 1995 based on the return rate experienced to this system in 1993 and 1994. A first year return of sockeyes to nearby Ursus Lake is also projected to total up to 6,500 fish. The Paint River Lakes were stocked with 750,000 sockeye salmon fry in both 1991 and 1992. However, based on poor adult returns from similar stocking levels at this system in recent years, no harvestable surplus of fish is forecast for 1995.

The fourth year enhanced sockeye return to Bear Lake in 1995 is expected to be about equal to the 1994 return, with a harvest forecast of only 10,000 fish. Success of this project has been discouraging thus far and therefore preseason predictions are uncertain.

Natural sockeye return projections for LCI are based solely on average historical harvests and could be expected to contribute up to 91,000 fish to commercial catches in 1995. However, runs of naturally produced sockeye have not reached expectations during recent years for unknown reasons. The Southern District is expected to contribute the most to the harvest of natural stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District, Aialik Lake in the Eastern District, and Mikfik Lake in the Kamishak Bay District.

Pink Salmon

Harvest of pink salmon in Lower Cook Inlet during 1995 is anticipated to reach nearly 1.9 million fish, with enhanced production expected to provide three-fourths of the total. The Tutka Hatchery, in the Southern District, is expected to contribute up to 1.4 million pinks to commercial harvests. Because stocking at the Halibut Cove Lagoon remote release site was discontinued in 1994, no adult pinks are expected to return there in 1995.

Natural spawning escapement levels into most major LCI systems were at or near desired levels in 1993, contributing to a harvest projection of over 465,000 naturally produced pinks throughout the entire LCI management area. The Port Dick area in the Outer District, Bruin Bay and Ursus and Rocky Coves in the Kamishak Bay District, and Humpy Creek in the Southern District, are all expected to have the greatest potential for harvestable surpluses, while Nuka Bay, Resurrection Bay, and Seldovia Bay could also see significant harvests.

Chum Salmon

Based solely on historical average harvests, the total LCI commercial chum salmon catch could be as high as 75,000 fish during 1995. The LCI chum harvest will consist exclusively of natural production since chum salmon enhancement is no longer conducted in LCI. Despite optimism for chum salmon during recent years, actual harvests during the past five seasons have failed to meet the preseason projections by significant amounts, suggesting that the historical average may be overly optimistic for 1995 as well.

The following table summarizes the projected harvest figures by species in the Lower Cook Inlet management area during 1995:

	Natural[a]	**Enhanced**	**Total**
CHINOOK	*NO FORECAST*	[b]	*NO FORECAST*
SOCKEYE	90,700	163,000[c]	253,700
COHO	*NO FORECAST*	[b]	*NO FORECAST*
PINK	465,500	1,400,000[c]	1,865,500
CHUM	75,400	0	75,400
Total	**631,600**	**1,563,000**[c]	**2,194,600**

[a] Forecasts of natural harvests are simply average commercial harvests of non-enhanced salmon returns from 1980 through 1994.

[b] Enhanced returns of these species, intended to primarily benefit recreational fisheries, will probably contribute some amount of fish to commercial harvests.

[c] Includes common property plus hatchery cost recovery harvests.

COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to salmon, the LCI herring management area is divided into five separate fishing districts, with commercial herring fishing historically occurring in all but the Barren Islands District (Figure 1). Herring fishing began in the Southern District in 1914 as a gillnet fishery within Kachemak Bay. Eight saltries, six near Halibut Cove, were operating during the peak of the fishery. Fishing with purse seines began in 1923, and after three subsequent years of average annual harvests approaching 8,000 short tons (st), herring populations, along with the fishery, collapsed.

The next LCI herring fishery began in 1939 and was centered in the Resurrection Bay and Day Harbor area of the Eastern District. This was a purse seine fishery with the product used exclusively for oil and meal reduction. Peak harvests occurred from 1944 through 1946, averaging 16,000 st each year, and stocks sharply declined thereafter, apparently due to overexploitation.

Japanese markets for a salted herring roe product resulted in development of a sac roe fishery in the 1960's. Market demand and the relatively high prices paid to fishermen caused rapid expansion of the fishing fleet and harvest. Although Department management and research efforts lagged behind the rapid growth of the fishery, conservative management strategies and guideline harvest levels were established in response to historical overexploitation of the herring fisheries statewide.

1994 SEASON SUMMARY

A total of 2,167 st of Pacific herring was landed in the Kamishak Bay District during 1994 (Tables 10 and 11). The herring sac roe

harvest was about 60% of the 1993 harvest of 3,570 st but only about 35% of the record high catch of 6,132 st set in 1987 (Appendix Table 31). Estimated exvessel value of the 1994 harvest was $1.5 million (Appendix Table 32).

Of the 74 LCI herring permits issued, 61 permit holders made deliveries in 1994. A total of 12 processors/buyers registered to buy herring in LCI, with all 12 actually taking fish this season, and roe recoveries averaged 10.6% for the sac roe harvest (Appendix Table 32).

Because 1994 aerial survey estimates were plagued by poor weather, the total herring biomass in the Kamishak Bay District was estimated using the preseason forecast. This model, based on survival rates and abundances, generated a total of 25,344 st (Appendix Table 32). Age composition from the commercial catch was similar to the preseason projection, despite weaker than anticipated returns of age-6 fish and stronger returns of age-8 and age-10 fish.

No sac roe herring fishery occurred in the Southern District in 1994 as fish were never present in sufficient numbers to allow a harvest. The Outer and Eastern Districts also were not opened to purse seining in 1994, primarily due to the lack of interest by processors and fishermen in these areas. The historical predominance of young (age-3 and age-4) fish, roe recoveries historically below 10%, and the exploratory nature of the fishery, have discouraged effort in these two districts.

ASSESSMENT METHODS

Aerial surveys were conducted throughout the herring spawning season to determine relative abundance and distribution of herring in the Kamishak Bay and Southern Districts. Data collection

methods were consistent with those used the previous four seasons. Numbers and distribution of herring schools, location and extent of milt, and visibility factors affecting survey results were recorded on index maps for each survey. Standard conversion factors of 1.52 st (water depths of 16 ft or less), 2.56 st (water depths between 16 and 26 ft), and 2.83 st (water depths greater than 26 ft) per 538 square feet were used to convert estimated herring school surface areas to biomass.

Survey conditions in the Kamishak Bay District were generally fair to poor throughout the season, meaning nearly all surveys were hampered by high winds which created substantial water turbidity and thus hindered aerial observation. A total of 14 surveys were completed in the Kamishak Bay District, with the longest consecutive period of grounding being 11 days between May 15 and May 26. Just six surveys were completed in the Southern District, while no comprehensive surveys of the Outer and Eastern Districts were conducted this season.

In the Kamishak Bay District, commercial landings were sampled to determine age, size, and sexual maturity of herring. In addition, test fishing by volunteer purse seine vessels was conducted to collect samples for roe recovery analysis prior to the fishery. Test fishing data was also used in postseason analysis to interpret aerial survey biomass data.

SPAWNING POPULATIONS

Kamishak Bay District

During the 1994 season aerial surveys to estimate biomass in the Kamishak Bay District were conducted from April 21 through June 5, with herring first observed April 22. Daily biomass estimates did not exhibit the normal trends in abundance i.e., build-up, peak,

and decline. The highest daily biomass observation was made on May 15 with an estimate of 2,630 st. As was the case in 1992 and 1993, and unlike previous years, there was no distinct separation in age composition between those fish appearing on the grounds initially and those following later. Normally the early fish tend to be larger and older, and a steady influx of younger age fish typically occurs as the return progresses. Test fish samples in 1994 documented a relatively high percentage of age-6 fish early in the return, with the percentage remaining fairly steady from the time of initial sampling up through the fishery.

As stated previously, the 1994 run was estimated using the preseason forecast of 25,400 st (Table 11, Appendix Table 32) because aerial surveys were hindered by inclement weather throughout the season. Postseason data analysis from test fishing and commercial harvests showed that the strong age-5 year class of herring seen in 1993 returned as age-6 fish to dominate the 1994 run at 44% of the total biomass by weight, followed by age-10 fish (14%) and age-7 fish (11%). Roughly 4% of the return was composed of fish younger than age 6 while only 2% was older than age 12 (Figure 15, Table 11).

Despite a reduction in overall biomass, as well as individual aerial surveys recording relatively sparse tonnages, the amount of active spawning documented in 1994 was the highest observed in many years. A total of 22 sightings occurred during surveillance flights, cumulatively totalling over seven linear miles of spawn. The heaviest spawning was seen on April 30, with nearly 2.5 miles documented, primarily in the vicinity of Chenik Head.

Southern District

A total of six aerial surveys of the Southern District were flown between May 3 and June 6. The 1994 run biomass, estimated as the sum of all daily biomass estimates, was 984 st. The majority of

herring were observed in Bear Cove, Glacier Spit, Mud Bay, and Mallard Bay, with the peak individual biomass survey (468 st) occurring on the season's final survey June 6. Peak surveys in areas where herring historically have been observed were as follows: Bear Cove, 326 st on June 6; Glacier Spit, 214 st on June 1; Mallard Bay, 72 st on June 1; and 80 st east of the Homer Spit/Mud Bay on May 16. No age composition or roe recovery samples were collected from the Southern District in 1994, and no observations of spawning occurred during the season.

Outer and Eastern Districts

No aerial surveys of the Outer and Eastern Districts were flown during the 1994 season. The size of the area and the characteristically poor weather in the Gulf of Alaska, which precludes surveys on a regular basis, makes aerial biomass estimation in these districts impractical. However, incidental observations of herring in June during the early part of the salmon season confirmed the presence of herring in these two districts again this season.

COMMERCIAL FISHERY

Kamishak Bay District

Spotter pilots and fishermen first located and fished the Kamishak Bay District herring populations in 1973, but after several years of commercial harvests in the late 1970's herring abundance severely declined and the district was completely closed beginning in 1980. Herring stocks appeared to quickly rebound in response to the closure, and the fishery was reopened in 1985. Since then, the fishery has been regulated to achieve a 10% to 20% exploitation rate mandated by the Alaska Board of Fisheries.

By 1989, fishing efficiency had evolved to a level where intensive regulatory management was required to ensure maximum value of the harvest and maintain the guideline harvest level while protecting younger age fish. Management strategy during the last four years in the Kamishak Bay District stabilized the harvest at an average of approximately 2,500 tons, or about 40% of the record high catch of 6,132 st set in 1987 (Appendix Tables 31 and 32).

Preseason management strategy in 1994 called for a guideline harvest level of 3,400 st based on a 15% exploitation of the forecasted biomass. The harvest rate was determined by the Kamishak Bay Herring Management Plan and is based upon the projected biomass. Although management prior to 1990 allowed this fishery to open on a specific calendar date, since that time industry technicians have been asked to evaluate test fish samples for roe recovery prior to commercial harvests to help maximize product quality and value.

The staff left from Homer for Kamishak Bay aboard the state's ***R/V PANDALUS*** on Sunday, April 17, but extremely poor weather and rough seas forced a return to port. Weather had abated the following day and the boat was able to reach the grounds in late afternoon. Despite the cold water temperatures (2 degrees C.) and winter-like conditions, the fleet was put on 12-hour notice effective at 6:30 p.m. Monday, April 18, to allow the Department to act quickly once fish were located. Poor weather the next two days precluded any aerial surveillance.

The first aerial survey occurred on April 21, but survey conditions were poor due to winds, water turbidity, and low clouds, and no herring were observed. Aerial surveys were continually hampered by adverse weather throughout the remainder of that first week. However, a volunteer test fish program utilizing commercial purse seine vessels was initiated, with the first samples of the season caught on April 22 near Chenik Head. Roe recovery estimates

generated by industry technicians averaged 10.5% mature roe (range 8.5% to 13.5%) and 1.9% immature roe from the first day's test fishing catches, while the percentage of males in the catch was relatively high at 55%. In order to allow the staff to react to any rapid developments, an announcement was made that evening reducing the advance notice period to two hours effective Saturday, April 23, at 9:00 p.m.

Age analysis on the first test fish samples, completed on April 23, showed close similarity to the preseason forecast, with age-6 fish dominating the samples at 47%, followed by age-10 at 16%, age-7 at 9%, age-8 at 8%, and age 11 at 5%. Although the strong age-6 component was forecasted, the apparent strength of the older age classes, particularly age-10, was unexpected.

The next aerial survey on Sunday, April 24, documented small quantities of herring in and around Amakdedulia Cove, however turbid waters continued to plague biomass estimation. Since that day's aerial survey indicated relatively small quantities of herring in the district and roe maturity samples slightly on the "green" side, the staff elected to delay an opening to allow more comprehensive sampling and further evaluation.

Additional test fish samples from Chenik Head on the morning of April 25 justified an announcement to the fleet that an opening on that evening's slack tide was being considered. At the time, an aerial survey was in progress, with additional samples being obtained further south along the reef near the Kamishak River mouth. Results from the survey and analysis of the samples prompted the staff to further reduce the advance notice period to one hour, effective at 6:00 p.m. April 25.

Because weather conditions had gradually improved over the course of the day, weather was no longer a factor in any potential opening. The staff felt that continued delay of the fishery could

result in reduced roe recoveries due to the possible influx of younger (immature) fish and/or an increase in the number of spawnouts. Because the management strategy attempts to minimize the harvest of younger age fish, and given the acceptable weather conditions, at 6:00 p.m. a 30-minute fishing period was announced for Management Area 5 (Figure 9), commencing by field announcement some time between 7:25 and 7:35 p.m. April 25. The field announcement on single sideband and marine VHF radio frequencies was used to alleviate the possibility of early sets.

Approximately 30 commercial spotter aircraft were present during the opening, but as in recent years turbid water conditions once again made aerial observation of herring ineffective. As the opening began, the entire fleet converged into a relatively small area just outside Amakdedulia Cove where the herring were obviously most concentrated. Of the 74 available permit holders, only 35 actually made deliveries totalling 778 st. Although over three-fourths of the preseason guideline remained to be taken, the ebbing tide, few remaining daylight hours, and the rapid onset of heavy fog precluded any extension of the fishing period that evening. The relatively small harvest and the concentrated distribution of the fleet suggested that herring abundance was light and the migration was in its earliest stages.

The weather over the next two days, consisting of 40-knot winds, rain, and visibility less than one mile, effectively halted all activity. Test fishing resumed on Thursday, April 28, but very few fish were located. Samples were collected from Iniskin Bay, the first from the northern end of the district, but the volume of fish was reportedly small. The weather improved the following day, April 29, allowing a comprehensive aerial survey of the district. Fish were documented on the Kamishak/Douglas Reefs, inside Amakdedulia Cove, along the full length of Chenik Head, and in Iniskin Bay. Active spawning was also seen in the area of Chenik Head. Test samples yielded roe recoveries averaging 11.3% and

average weights of 215 grams. Based on this information, a second (60-minute) opening was announced for Management Area 5 that afternoon, April 29, commencing between 4:55 and 5:05 p.m.

The majority of effort during the second opening took place in and around Amakdedulia Cove and Chenik Head. Total catch was 1,388 st taken by 53 vessels (Table 10). The cumulative harvest of 2,167 st from both openings, taken by 61 different vessels, averaged 10.64% roe recovery. Although the preseason guideline had still not been met, the window of opportunity began to quickly disappear as samples obtained the next morning contained nearly all spawnouts. Another aerial survey on Saturday, April 30, documented intense spawning activity north of Chenik Head in the lagoon as well as further south on the Douglas River Reef. In addition, a substantial number of vessels left or were in the process of leaving the district enroute to Togiak. Based on the relatively small biomass in the district and the number of spawnouts present in both the southern and northern portions of the district, the advance notice period was cancelled at 3:00 p.m. May 1, effectively closing the Kamishak Bay District herring fishery for the season.

Post-fishery age-weight-length analysis from the commercial harvest showed samples dominated by ages 6, 10, and 7 fish (44%, 14%, and 11%, respectively), followed in descending proportional order by ages 8, 11, and 9 fish (Table 11). The estimated exvessel value of the 1994 catch was $1.5 million (Appendix Table 32) based on a sac roe weighted average price of $693 per ton. Most companies paid an "on-grounds" base price with additional postseason settlements paid (or to be paid) after price finalization with the foreign market.

The Department of Public Safety, Division of Fish and Wildlife Protection (FWP) enforcement vessel ***P/V TROOPER*** was stationed on the grounds for the duration of the 1994 herring fishery. Two protection officers from Kodiak and one from Homer actively monitored the fleet, with no major violations documented and only

a few minor infractions, such as lack of crewmember licenses, noted. No doubt the conspicuous enforcement efforts of FWP during recent seasons in the Kamishak Bay herring fishery has discouraged blatant disregard for the regulations.

By Alaska Board of Fisheries directive, the Kamishak Bay District herring fishery is managed with the intent of harvesting 10% to 20% of the available biomass. Because the harvest fell short of the guideline, the overall exploitation in 1994 was only 8.5% of the estimated total biomass, based on a total catch of 2,167 st and an escapement biomass of 23,177 st (Appendix Table 32).

Southern District

Management strategy for the Southern District sac roe fishery was changed in 1989 to allow for a limited harvest of 150 to 200 st for the purposes of obtaining age, weight, length and roe recovery information. Sac roe herring had not been fished in the Southern District since 1979 when poor stock conditions forced an area-wide closure. Only one other fishery has occurred since that time, when 171 st of herring averaging 8.9% roe recovery were harvested by 10 vessels in a single 2.5-hour opening in Mallard Bay during 1989 (Appendix Table 31).

After the completion of the Kamishak Bay herring fishery, management attention was directed toward the Southern District on May 3 when the first aerial survey was flown. Surveys continued into early June, but a commercial harvest of sac roe herring was not allowed in the Southern District in 1994 because abundance estimates failed to document sufficient quantities of herring to warrant an opening.

Outer and Eastern Districts

During the early years of sac roe herring fishing in LCI, seining within the Outer and Eastern Districts primarily occurred in Resurrection Bay. Following a period of suspected over-exploitation, herring stocks throughout LCI generally declined after 1973. Concern over this decline prompted the Board of Fish and Game in 1974 to establish a 4,000-ton quota for all of Lower Cook Inlet, with the Outer and Eastern Districts each allocated 1,000 st. The quotas were never utilized since stock abundance continued to decline, and the Outer and Eastern Districts were closed to fishing from 1975 through 1984.

In 1985, the sac roe fishery was allowed to resume in the Outer and Eastern Districts on a very conservative basis, even though no noticeable change in spawning biomass had been observed. Because of reduced stock abundance and extreme vulnerability to fishing, guideline harvest levels were set at 150 to 200 st for each of the four fishing areas created within these two districts. Fishing effort in 1985 was minimal and the majority of the harvest (216 st; Appendix Table 31) once again occurred in Resurrection Bay.

Only limited and sporadic harvests have occurred in these two districts since 1985, with the majority of both the herring harvest and the observed biomass during the past six years comprised of age-3 and age-4 fish. Unlike the Southern and Kamishak Bay Districts, samples from the Outer and Eastern Districts have contained up to 14% age-2 (sexually immature) herring. Although sampling has been limited, no discernable shift to older age herring has ever been observed, suggesting the possibility that the Outer and Eastern Districts may be feeding and rearing grounds for juvenile fish of Prince William Sound origin.

Despite significant opportunity for exploratory fishing on a daily basis in the Outer and Eastern Districts during 1991 and 1992, the

predominance of juvenile herring in the population and the history of marginally acceptable roe recoveries from fish caught in these areas has contributed to a lack of interest by fishermen and processors. These conditions were again prevalent in both 1993 and 1994 and, consequently, the Outer and Eastern Districts were not opened to purse seining during either of the past two seasons.

HERRING OUTLOOK AND MANAGEMENT STRATEGY FOR 1995

Kamishak Bay District

The 1995 total biomass of herring in Kamishak Bay District is projected to be 22,000 st, approximately 13% less than the 1994 estimated biomass (Figure 14, Table 11). The 1995 Kamishak herring abundance forecast was generated from an age-structured-analysis (ASA) model similar to that used last year for Kamishak Bay and also that used to forecast Sitka Sound, PWS, and Togiak. Best available data indicates a stabilization or slight decrease in herring abundance. Over 60% of the 1995 projected biomass (by weight) will be comprised of age-7 fish from the 1988 year class (Figure 4). This should equate to a mean weight of 202 grams.

The Kamishak Bay District Herring Management Plan (**5 AAC 27.465.**) dictates that an overall 15% exploitation rate be utilized to set the 1995 guideline harvest level since the projected biomass falls between 20,000 and 30,000 short tons. Based on the 1995 projected return of 21,998 tons, a surplus of approximately 3,300 tons would be available for harvest at the 15% exploitation rate. In addition to the spring sac roe fishery in Lower Cook Inlet, a fall food and bait fishery on Kamishak Bay herring stocks occurs in the Shelikof Straits area of the Kodiak Management Area. This fishery has an allocation not to exceed 2% of the total forecasted Kamishak Bay herring biomass. Harvest allocation, in accordance with the Kamishak Bay Herring Management Plan, will be as follows:

		Tons
TOTAL ALLOWABLE HARVEST	(15.0%)	3,300
SHELIKOF STRAITS FOOD & BAIT	(1.5%)	330
KAMISHAK BAY SAC ROE HARVEST	(13.5%)	2,970

As in recent years, a very conservative approach will be taken with regard to any harvest of young, newly recruited herring since these fish will provide future spawning stock and contribute to future harvests. No fishery on young (age 3-4) fish will be considered unless this recruit population exceeds 40-50% of the observed biomass. Unless data becomes available indicating that significant recruitment has occurred, or that an unusually large biomass has moved into the district, the Kamishak Bay sac roe harvest will not be allowed to exceed 2,970 tons.

Other Districts

Based on recent trends in herring abundance and age structure in the Southern, Outer, and Eastern Districts of LCI, no commercial herring harvests are anticipated in these areas during 1995. Sufficient quantities of herring in the Southern District must be documented before a commercial opening is considered. Monitoring of the Southern District herring stocks will occur as in the past through the use of aerial surveys in conjunction with possible test fishing samples. The Outer and Eastern Districts will only be allowed to open if adequate evidence becomes available suggesting commercial quantities of adult herring are present. Any potential fishery in these districts will be considered "exploratory" in nature and will be managed accordingly.

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Table 1. Commercial, hatchery, and derby salmon catches in numbers of fish by species, district, and gear type, Lower Cook Inlet, 1994.

DISTRICT Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Total
SOUTHERN						
Commercial:						
Set gillnet	1,103	14,004	1,073	23,621	2,419	42,220
P. Seine	126	47,494	299	612,724	211	660,854
Hatchery:						
P. Seine	1	3,033	1	953,364	1	956,400
TOTAL	**1,230**	**64,531**	**1,373**	**1,589,709**	**2,631**	**1,659,474**
OUTER						
Commercial:						
P. Seine	**0**	**5,930**	**993**	**13,200**	**32**	**20,155**
EASTERN						
Commercial:						
P. Seine	1	1,610	3,835	44,987	2,792	53,225
Derby:						
Hook & Line	0	0	1,608	0	0	1,608
Hatchery:						
Weir	0	8,051	4,967	0	0	12,623
TOTAL	**1**	**9,661**	**10,410**	**44,987**	**2,792**	**67,456**
KAMISHAK						
Commercial:						
P. Seine	0	18,509	1,897	33	14	20,453
Hatchery:						
P. Seine	0	16,787	0	0	0	16,787
TOTAL	**0**	**35,296**	**1,897**	**33**	**14**	**37,240**
LCI TOTAL	1,231	115,418	14,673	1,647,929	5,469	1,784,720
PERCENT	0.1	6.5	0.8	92.3	0.3	100.0
1974-93 AVERAGE	1,089	169,038	12,407	992,654	104,171	1,279,359

Table 2. Commercial chinook salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1994.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove	454		454
Halibut Cove Lagoon	60		60
China Poot Bay	20		20
Neptune Bay	4		4
Tutka/Kasitsna Bays	199		199
Barabara Creek	86		86
Seldovia Bay	407		407
SOUTHERN DISTRICT TOTAL	**1,230**		**1,230**
OUTER DISTRICT TOTAL	**0**		**0**
EASTERN DISTRICT			
Aialik Bay	1		1
EASTERN DISTRICT TOTAL	**1**		**1**
KAMISHAK BAY DISTRICT TOTAL	**0**		**0**
TOTAL LOWER COOK INLET	**1,231**		**1,231**

[a] Chinook escapement in Lower Cook Inlet is very limited; no escapement surveys are conducted.

Table 3. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1994.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		4	4
Halibut Cove	8,501		8,501
Halibut Cove Lagoon	3,676		3,676
China Poot Bay			
Common Property Fishery	26,697		
Hatchery Cost Recovery	2,486		
China Poot Creek		385[b]	
Total Run			29,568
Neptune Bay			
Common Property Fishery	9,007		
Hatchery Cost Recovery	539		
Total Run			9,546
Tutka/Kasitsna Bays	9,137[c]		9,137
Seldovia Bay/River	2,665		2,665
Barabara Creek	1,823	4	1,827
Port Graham		4	4
English Bay		13,800[d]	13,800
SOUTHERN DISTRICT TOTAL	**64,531**	**14,197**	**78,728**
OUTER DISTRICT			
Port Chatham		1	1
Windy Bay			
Windy Left		1	
Windy Right		2	
Total Run			3
Port Dick			
South Section	2		
Head End Creek		10	
Island Creek		2	
Total Run			14
East Nuka (McCarty Fiord)	5,928		
Desire Lake		10,450	
Delight Lake		5,600	
Delectable (Ecstasy)		1,300	
Total Run			23,278
OUTER DISTRICT TOTAL	**5,930**	**17,366**	**23,296**

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Table 3. (page 2 of 2)

Subdistrict/System	Catch	Escapement[a]	Total Run
EASTERN DISTRICT			
Aialik Bay/Lake	623	7,300	7,923
Resurrection Bay North			
Common Property Fishery	987		
Hatchery Cost Recovery	8,051		
Bear Lake		8,592[d]	
Salmon Creek		10	
Clear Creek		6	
Total Run			17,646
EASTERN DISTRICT TOTAL	**9,661**	**15,908**	**25,569**
KAMISHAK BAY DISTRICT			
Ursus Cove (head end creek)		25	25
Kirschner Lake			
Common Property Fishery	14,465		
Hatchery Cost Recovery	16,787		
Total Run			31,252
Bruin Bay	615		
Bruin Lake Creek		4,000	
Bruin River		200	
Total Run			4,815
Chenik Lake			
Amakdedori Creek		800	
Chenik Creek/Lake		808[d]	
Total Run			1,608
Paint River		550[e]	550
McNeil Cove/Mikfik Creek		9,490	9,490
Kamishak/Douglas Reef			
Little Kamishak River		300	
Douglas Reef Creek		25	
Total Run			325
Douglas River/Silver Beach	3,429		3,429
KAMISHAK BAY DISTRICT TOTAL	**35,296**	**16,198**	**51,494**
TOTAL COOK INLET	**115,418**	**63,669**	**179,087**

[a] Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.
[b] No freshwater escapement, prevented by barrier falls.
[c] Figure includes 8 sockeyes taken during hatchery pink salmon cost recovery harvests.
[d] Weir counts.
[e] No freshwater escapement, ladder not opened during 1994.

Table 4. Commercial coho salmon catches (including hatchery cost recovery and sport fish derby) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1994.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove	137		137
Halibut Cove Lagoon	1		1
China Poot Bay	132		132
Neptune Bay	63[b]		63
Tutka/Kasitsna Bays	704		704
Seldovia Bay	81		81
Barabara Creek	255		255
SOUTHERN DISTRICT TOTAL	**1,373**		**1,373**
OUTER DISTRICT			
Port Dick South Section	14		14
East Nuka (McCarty Fiord)	979		979
OUTER DISTRICT TOTAL	**993**		**993**
EASTERN DISTRICT			
Aialik Bay	3,835		3,835
Resurrection Bay North			
Hatchery Cost Recovery	4,967		
Sport Derby	1,608		
Total Run			6,575
EASTERN DISTRICT TOTAL	**10,410**		**10,410**
KAMISHAK BAY DISTRICT			
Bruin Bay	1		1
McNeil River		3,750	3,750
Douglas River/Silver Beach	1,896		
Douglas Reef (right) Creek		10,100	
Total Run			11,996
KAMISHAK BAY DISTRICT TOTAL	**1,897**	**13,850**	**15,747**
TOTAL LOWER COOK INLET	**14,673**	**13,850**	**28,523**

[a] Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.

[b] Figure includes 1 coho taken during hatchery sockeye cost recovery.

Table 5. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1994.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		14,104	14,104
Halibut Cove	29,665		29,665
Halibut Cove Lagoon	75,936		75,936
China Poot Bay/Creek	20,265[b]	5,732	25,997
Neptune Bay	3,928[b]		3,928
Tutka/Kasitsna Bays			
Common Property Fishery	498,436		
Hatchery Cost Recovery	953,231[c]		
Hatchery Brood stock		154,000	
Tutka Lagoon Creek		14,546	
Total Run			1,620,213
Barabara Creek	2,868	4,515	7,383
Seldovia Bay & River	5,380	24,436	29,816
Port Graham			
Hatchery Brood Stock		733	
Port Graham River		7,613	
Port Graham Left		856	
Total Run			9,202
SOUTHERN DISTRICT TOTAL	**1,589,709**	**226,535**	**1,816,244**
OUTER DISTRICT			
Dogfish Bay		1,272	1,272
Port Chatham		3,298	3,298
Chugach Bay		2,534	2,534
Windy Bay			
Windy River Left		2,964	
Windy River Right		2,162	
Total Run			5,126
Rocky Bay			
Scurvy Creek		940	
Rocky River		17,974	
Total Run			18,914
Port Dick			
South Section	1,553		
Head End Creek		18,118	
Slide Creek		2,542	
Middle Creek		2,431	
Island Creek		28,347	
Total Run			52,991

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Table 5. (page 2 of 3)

Subdistrict/System	Catch	Escapement[a]	Total Run
OUTER DISTRICT (cont'd)			
Nuka Island			
South Nuka Island Creek		1,363	
Berger Bay		14	
Total Run			1,377
East Nuka (McCarty Fiord)	11,647		
James Lagoon		760	
Total Run			12,407
OUTER DISTRICT TOTAL	**13,200**	**84,719**	**97,919**
EASTERN DISTRICT			
Aialik Bay	44,957		44,957
Resurrection Bay North	30		
Bear/Salmon Creeks		34,831	
Clear Creek		2,796	
Grouse Creek		935	
Lost Creek		90	
Sawmill Creek		1,452	
Spring Creek		987	
Tonsina Creek		7,013	
Tonsina Left Creek		1,115	
Thumb Cove		10,846	
Total Run			60,095
Renard Island (Humpy Cove)		2,248	2,248
EASTERN DISTRICT TOTAL	**44,987**	**62,313**	**107,300**
KAMISHAK BAY DISTRICT			
Iniskin Bay			
North Head Creek		960	
Sugarloaf Creek		100	
Total Run			1,060
Ursus Cove			
Brown's Peak Creek		1,316	
Ursus Lagoon Right Cr.		100	
Ursus Lagoon Creek		600	
Total Run			2,016
Rocky Cove (Sunday Creek)		3,102	3,102
Kirschner Lake	9		9

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Table 5. (page 3 of 3)

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK DISTRICT (cont'd.)			
	20	5,860	5,880
Bruin Bay & River		666	666
Chenik Lake (Amakdedori Cr.)	4		4
Douglas River/Silver Beach			
KAMISHAK BAY DISTRICT TOTAL	**33**	**12,704**	**12,737**
TOTAL COOK INLET	**1,647,929**	**386,271**	**2,034,200**

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

[b] China Poot/Neptune catches include 66/67 pinks (respectively) caught during hatchery sockeye cost recovery.

[c] In addition to the total reported here, 5,833 pinks were harvested for hatchery cost recovery but not sold and were subsequently discarded.

Table 6. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1994.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		86	86
Halibut Cove	77		77
Halibut Cove Lagoon	1		1
China Poot Bay	29	1	30
Neptune Bay	7		7
Tutka Bay (Tutka Lagoon Cr.)	846[b]	349	1,195
Barabara Creek	451		451
Seldovia Bay/River	1,220	1,381	2,601
Port Graham			
Port Graham River		5,205	
Port Graham Left		66	
Total Run			5,271
SOUTHERN DISTRICT TOTAL	**2,631**	**7,088**	**9,719**
OUTER DISTRICT			
Dogfish Bay		11,347	11,347
Port Chatham		279	279
Windy Bay			
Windy River Left		129	
Windy River Right		196	
Total Run			325
Rocky Bay/River		1,941	1,941
Port Dick			
South Section	30		
North Section			
Head End Creek		3,481	
Slide Creek		565	
Middle Creek		3,800	
Island Creek		8,800	
Total Run			16,676
Nuka Island			
South Nuka Island Creek		6	
Petrof River		686	
Total Run			692
East Nuka (James Lagoon)	2	434	436
OUTER DISTRICT TOTAL	**32**	**31,664**	**31,696**

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Table 6. (page 2 of 2)

Subdistrict/System	Catch	Escapement[a]	Total Run
EASTERN DISTRICT			
Aialik Bay	297		297
Resurrection Bay North	2,495		
Bear/Salmon Creeks		1	
Clear Creek		83	
Sawmill Creek		254	
Spring Creek		351	
Tonsina Creek		6,853	
Tonsina Left Creek		135	
Total Run			10,172
EASTERN DISTRICT TOTAL	**2,792**	**7,677**	**10,469**
KAMISHAK BAY DISTRICT			
Iniskin Bay			
Iniskin River		18,880	
Sugarloaf Creek		2,201	
North Head Creek		361	
Total Run			21,442
Cottonwood Bay/Creek		10,238	10,238
Ursus Cove			
Brown's Peak Creek		1,362	
Ursus Lagoon Creek		1,844	
Ursus Lagoon Right Creek		4,355	
Total Run			7,561
Rocky Cove (Sunday Creek)		2,169	2,169
Kirschner Lake	6		6
Chenik Lake		6,094	6,094
McNeil River		14,955	14,955
Kamishak River/Douglas Reef			
Little Kamishak River		8,995	
Strike Creek		1,959	
Big Kamishak River		[b]	
Douglas Reef (right) Cr.		1,222	
Total Run			12,176
Douglas R./Douglas Beach Cr.	8	4,301	4,309
KAMISHAK BAY DISTRICT TOTAL	**14**	**78,936**	**78,950**
TOTAL COOK INLET	**5,469**	**125,365**	**130,834**

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

[b] Insufficient survey data to generate escapement estimate.

Table 7. Exvessel value[a] of the commercial salmon catch in number of dollars by species and gear type, Lower Cook Inlet, 1994.

	Chinook	Sockeye	Coho	Pink	Chum	Total
COMMON PROPERTY - PURSE SEINE						
No. Fish	127	73,543	7,024	670,944	3,049	754,687
Pounds	1,532	299,132	65,723	2,121,344	18,380	2,506,111
Price/Lb.	$0.90	$1.12	$0.66	$0.16	$0.15	
Value	$1,379	$335,028	$43,377	$339,415	$2,757	$721,956
COMMON PROPERTY - SET GILLNET						
No. Fish	1,103	14,004	1,073	23,621	2,419	42,220
Pounds	16,914	75,320	8,739	93,617	16,730	211,320
Price/Lb.	$0.96	$1.23	$0.71	$0.15	$0.35	
Value	$16,237	$92,644	$6,205	$14,043	$5,856	$134,985
HATCHERY - PURSE SEINE & WEIR						
No. Fish	1	27,871	4,968	953,364	1	986,205
Pounds	14	94,996	50,998	2,752,655	10	2,898,673
Price/Lb.	$0.79	$0.72	$0.33	$0.15	$0.20	
Value	$11	$68,469	$16,830	$412,898	$10	$498,218
SPORT FISHING DERBY - HOOK & LINE						
No. Fish			1,608			1,608
Pounds			24,128			24,128
Price/Lb.			$1.10			
Value			$26,541			$26,541
TOTAL ALL GEARS						
No. Fish	1,231	115,418	14,673	1,647,929	5,469	1,784,720
Pounds	18,460	469,448	149,588	4,967,616	35,120	5,640,232
Price/Lb.	$0.95	$1.06	$0.62	$0.12	$0.25	
Value	$17,627	$496,141	$92,953	$766,356	$8,623	$1,381,700

[a] Exvessel value is calculated from average prices, which are determined only by fish ticket information and may not reflect retroactive or postseason adjustments.

Table 8. Emergency orders issued for commercial and subsistence salmon and herring fisheries in Lower Cook Inlet, 1994.

Number/ Issue Date	DESCRIPTION
2-F-H-001-94 April 25	Opens Management Area 5 in the Kamishak Bay District to commercial herring sac roe seining for approximately one-half hour commencing by an ADF&G field announcement some time between 7:25 p.m. and 7:35 p.m., Monday, April 25, 1994. The fishery will close at 8:00 p.m. Management Area 5 includes those waters south of 59° 16.68' N. latitude and west of 153° 37.0' W. longitude.
2-F-H-002-94 April 29	Opens Management Area 5 in the Kamishak Bay District to commercial herring sac roe seining for approximately on hour commencing by an ADF&G field announcement some time between 4:55 p.m. and 5:05 p.m., Friday, April 29, 1994. The fishery will close at 6:00 p.m. Management Area 5 includes those waters south of 59° 16.68' N. latitude and west of 153° 37.0' W. longitude.
2-F-H-003-94 May 6	Opens those waters of Resurrection Bay in the Eastern District enclosed by a line from Aialik Cape south to a point one mile due south of Aialik Cape, then northeast to a point one mile due south of Cape Resurrection, then north to Cape Resurrection, to commercial salmon seining on a schedule of two forty-hour weekly fishing periods, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective Monday, May 9, 1994, until further notice.
2-F-H-004-94 May 31	Closes the Port Graham and English Bay areas to commercial set gillnet fishing prior to the regulatory opening date of June 6, 1994, until further notice.
2-F-H-005-94 May 31	Closes the Port Graham Subdistrict to subsistence gillnet fishing effective 6:00 a.m. Monday, June 6, 1994, until further notice.

-continued-

Table 8. Page 2 of 8.

Number/ Issue Date	DESCRIPTION
2-F-H-006-94 May 31	Establishes two 48-hour weekly fishing periods in the Kamishak Bay District commercial salmon seine fishery, which opens by regulation on June 1, 1994. These periods shall be from Monday 6:00 a.m. until Wednesday 6:00 am. and from Thursday 6:00 a.m. until Saturday 6:00 a.m. In addition, this emergency order closes the Paint River Subdistrict within the Kamishak Bay District to commercial salmon seining until further notice, and it also allows seining to occur up to the mouth of Chenik Creek in the Chenik Subdistrict.
2-F-H-007-94 June 8	Designates and establishes Special Harvest Areas for the Cook Inlet Aquaculture Association (CIAA) in the Chenik, Paint River, Bruin Bay, and China Poot Subdistricts of the Lower Cook Inlet management area. During periods established by emergency order, CIAA may harvest a portion of the sockeye salmon returning to these areas for recovery of operational costs expended towards sockeye salmon enhancement programs in Lower Cook Inlet.
2-F-H-008-94 June 15	Closes the Chenik Lake and Kirschner Lake Special Harvest Areas to the common property salmon seine fishery and opens waters of the Kirschner Lake and Paint River Special Harvest Areas in the Kamishak Bay District, and the China Poot and Hazel Lake Special Harvest Areas in the Southern District, to the harvest of salmon seven days per week by authorized agents of Cook Inlet Aquaculture Association (CIAA) effective at 6:00 a.m. Thursday, June 16, 1994, until further notice.
2-F-H-009-94 June 22	Opens portions of the China Poot, Tutka Bay, and Halibut Cove Subdistricts, all within the Southern District, to commercial salmon

-continued-

Number/ Issue Date	DESCRIPTION
	seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00a.m. Monday, June 27, 1994, until further notice. In the China Poot Subdistrict, commercial seining shall be allowed five days per week only in those waters outside (offshore) of the China Poot and Hazel Lake Special Harvest Areas beginning June 27. In the Halibut Cove Subdistrict, seining shall be allowed only in waters outside of Halibut Cove Lagoon beginning June 27 on a five days per week basis. Seining in Halibut Cove Lagoon shall be allowed effective 6:00 a.m. Tuesday, July 5, 1994, on a five days per week basis. In the Tutka Bay Subdistrict, commercial seining is restricted to those waters seaward of a line extending from the "rock quarry" on the north side of the bay at approximately 59°30'14" N. latitude, 151°28'14" W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59°28'31" N. latitude, 151°28'55" W. longitude, five days per week effective 6:00 a.m. Monday, June 27, 1994. This emergency order also opens the commercial set gillnet fishery in Halibut Cove Subdistrict five days per week effective 6:00 a.m. Tuesday, July 5, 1994, until further notice. This emergency order also repeals the regulatory closed waters markers in China Poot Bay, and also establishes temporary closed waters at the head of China Poot Bay to provide a Dungeness crab sanctuary.
2-F-H-010-94 June 22	Designates and establishes Special Harvest Areas for CIAA in the Tutka Bay Subdistrict and for Port Graham Hatchery Corporation in the Port Graham Subdistrict for the purpose of harvesting fish for brood stock and cost recovery. The Tutka Special Harvest Area

-continued-

Number/ Issue Date	DESCRIPTION
	shall open to the harvest and sale of salmon by authorized agents of CIAA seven days per week effective at 6:00 a.m. Monday, June 27, 1994, until further notice.
2-F-H-011-94 July 12	Opens those waters of the Port Dick Subdistrict in the Outer District east of a line from a department marker on the south shore of Port Dick near Phillipino Cove at approximately 151° 06' 00" W. longitude, 59° 15' 20" N. latitude, to a department marker on the southwest shore of Taylor Bay at approximately 151° 05' 00" W. longitude, 59° 16' 12" N. latitude, to commercial salmon seining for two 40-hour periods per week, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective at 6:00 a.m. Thursday, July 14, 1994, until further notice. Waters open to fishing include statistical reporting areas 232-06 and 232-08. Waters of the North Section (232-09) and the south shore of the South Section (232-07) of the Port Dick Subdistrict remain closed to fishing. This emergency order also opens waters of Aialik Subdistrict in the Eastern District to commercial salmon seining on a schedule of two 48-hour weekly fishing periods, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and from Thursday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Thursday, July 14, 1994, until further notice. Waters of Aialik Lagoon remain closed to fishing. In addition, this emergency order closes commercial salmon seining in waters of Resurrection Bay effective at 6:00 a.m. Thursday, July 14, 1994, until further notice.

-continued-

Number/ Issue Date	DESCRIPTION
2-F-H-012-94 July 14	Reopens the Port Graham Subdistrict to subsistence gillnet fishing effective 6:00 a.m. Monday, July 18, 1994, until further notice.
2-F-H-013-94 July 14	Expands the area open to commercial salmon seining in the Tutka Bay Subdistrict effective at 12:00 noon Friday, July 15, 1994, until the normal closure of the weekly period at 6:00 a.m. Saturday, July 16, 1994. The area open to seining in the Tutka Bay Subdistrict during this period includes those waters northwest (seaward) of the HEA power lines. Beginning at 6:00 a.m. Monday, July 18, 1994, the area open to commercial seining will once again be restricted to those waters seaward of a line from the Tutka Bay Lodge on the south shore to the "rock quarry" on the north shore, on a five day per week basis until further notice.
2-F-H-014-94 July 19	Expands the area open to commercial salmon seining in the Tutka Bay Subdistrict of the Southern District effective at 9:00 p.m. Tuesday, July 19, 19994, on a five-day-per-week basis until further notice. The area open to seining in the Tutka Bay Subdistrict, from Monday 6:00 a.m. until Saturday 6:00 a.m., includes those waters northwest (seaward) of the HEA power lines. In addition, this emergency order opens waters of China Poot Subdistrict, including the China Poot and Hazel Lakes Special Harvest Areas (see LCI E.O. #2-F-H-007-94), to commercial salmon seining, also on a five-day-per-week basis, effective at 9:00 p.m. Tuesday, July 19, 1994, until further notice.
2-F-H-015-94 July 22	Restricts the area open to commercial salmon seining in the Tutka Bay Subdistrict of the Southern District to those waters seaward of a

-continued-

Number/ Issue Date	DESCRIPTION
	line from the Tutka Bay Lodge on the south shore at approximately 59°28'31" N. latitude, 151°28'55" W. longitude, to the "rock quarry" on the north shore at approximately 59°30'14" N. latitude, 151°28'14" W. longitude, effective at 6:00 a.m. Monday, July 25, 1994, five days per week until further notice.
2-F-H-016-94 July 28	Opens waters of the East Nuka Subdistrict between the latitude of the entrance to James Lagoon at approximately 59°33'30" N. latitude, and the regulatory markers near the Parks Service tent camps at approximately 59°37'30" N. latitude, to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 12:00 noon Friday, July 29, until further notice. Waters south of the entrance to James Lagoon, as well as waters north of the regulatory markers by the Parks Service camp, remain closed to fishing. The closed waters markers at the mouth of Desire Lake Creek **WILL NOT** be in effect and fishing will be allowed up to the stream mouth.
2-F-H-017-94 July 29	Closes waters of the Kirschner Lake Special Harvest Area (see LCI E.O. #2-F-H-008-94) in the Kamishak Bay District to salmon hatchery cost recovery harvest by Cook Inlet Aquaculture Association effective at 6:00 a.m. Monday, August 1, 1994, and simultaneously opens waters of the Bruin Bay Subdistrict, including the Kirschner Lake SHA, to commercial purse seine fishing five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Monday, August 1, 1994, until further notice.
2-F-H-018-94 August 5	Opens waters of Tutka Bay Subdistrict to commercial purse seine fishing five days per week, from Monday 6:00 a.m. until Saturday

-continued-

Number/ Issue Date	DESCRIPTION
	6:00 a.m., effective 6:00 a.m. Monday, August 8, 1994, until further notice. In addition, this emergency order opens waters of Tutka Lagoon to commercial purse seine fishing five days per week, effective at 6:00 a.m. Tuesday, August 9, 1994, until further notice.
2-F-H-019-94 August 10	Opens waters of the South Section of the Port Dick Subdistrict, including those along the south shore described as statistical reporting area 232-07, in the Outer District to commercial salmon seining for two 40-hour periods per week, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective at 12:00 noon Thursday, August 11, 1994, until further notice. Outside waters of Port Dick Subdistrict, described as statistical reporting areas 232-06 and 232-08, are already open to seining on the same two 40-hour periods per week. Waters of the North Section (232-09) of the Port Dick Subdistrict remain closed to fishing.
2-F-H-020-94 August 5	Reinstates the regulatory closed waters markers in China Poot Bay in the China Poot Subdistrict of the Southern District.
2-F-H-021-94 August 12	Opens waters of the Port Graham Special Harvest Area (see LCI E.O. #2-F-H-010-94) to the harvest of salmon for hatchery brood stock seven days per week by authorized agents of Port Graham Hatchery Corporation, effective at 6:00 a.m. Saturday, August 13, 1994, until further notice.
2-F-H-022-94 August 15	Delays the opening of the Southern District (Kachemak Bay) subsistence set gillnet fishery for coho salmon until 6:00 a.m. Tuesday, August 16, 1994.

-continued-

Table 8. Page 8 of 8.

Number/ Issue Date	DESCRIPTION
2-F-H-023-94 August 17	Closes the Southern District (Kachemak Bay) subsistence coho salmon set gillnet fishery effective at 6:00 a.m. Saturday, August 20, 1994, for the remainder of the 1994 season.
2-F-H-024-94 August 19	Opens waters of the North Section of Port Dick Subdistrict, otherwise described as statistical reporting area 232-09, in the Outer District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m. In addition, this emergency order modifies the weekly fishing periods in the South Section of Port Dick Subdistrict, including statistical reporting areas 232-06, 232-07, and 232-08, to the same five day per week schedule as that in the North Section. Both changes become effective at 6:00 a.m. Monday, August 22, 1994, until further notice.
2-F-H-025-94 August 26	Opens waters of Douglas River and Kamishak River Subdistricts, both in the Kamishak Bay District, to commercial salmon seining seven days per week effective at 6:00 a.m. Monday, August 29, 1994. These waters will remain open on this weekly schedule until 6:00 a.m. Saturday, September 10, 1994, at which time they will close for the remainder of the season. Waters affected by this emergency order are described as statistical reporting areas 249-40 and 249-45.

Table 9. Total return of adult pink salmon to the Tutka Bay Hatchery and the Halibut Cove Lagoon remote release site in the Southern District of Lower Cook Inlet, 1994.

COMMERCIAL HARVEST	
Tutka Bay/Lagoon:	
Purse Seine	487,412
Set Gillnet	11,024[a]
Hatchery Cost Recovery	953,231[b]
Tutka Commercial Harvest	1,451,667
Halibut Cove/Lagoon:	
Purse Seine	101,252
Set Gillnet	4,349
Halibut Cove/Lagoon Commercial Harvest	105,601
SPORT HARVEST	
Tutka Lagoon	2,000
Halibut Cove Lagoon	2,000
Homer Spit Fishing Lagoon	0
Total Sport Catch	4,000
ESCAPEMENT	
Tutka Creek and Channel	14,546
Tutka Hatchery Brood Stock	154,000
Total Escapement	168,546
TOTAL RETURN	1,729,814

[a] Based primarily on run timing, all of the set gillnet pink salmon catch in the Tutka Subdistrict was apportioned to the Tutka Hatchery return.

[b] In addition to the total reported here, 5,833 pinks were harvested for cost recovery but were not sold and were subsequently dumped.

Table 10. Commercial purse seine catch of sac roe herring in short tons and average roe recovery in percent, by statistical area and date, Kamishak Bay District, Lower Cook Inlet, 1994.

Date	Statistical Area & Location		No. of Permits	No. of Landings	Tons	Roe %
4/25	249-50	McNeil Cove	[a]	[a]	2.0	12.0
	249-52	Nordyke Island	5	5	236.4	10.6
	249-55	Chenik Head/ Amakdedulia Cove	30	35	540.1	11.0
4/29	249-52	Nordyke Island	[a]	[a]	6.6	9.7
	249-55	Chenik Head/ Amakdedulia Cove	52	70	1,381.5	10.5
	Totals		61	112	2,166.6	10.6

[a] To comply with **AS 16.05.815. CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS,** effort data has been masked where fewer than four vessels fished in a given area.

Table 11. Total biomass estimates and commercial catch of Pacific herring in short tons by age class, Kamishak Bay District, 1994, and 1995 forecast.

Age	1994 Estimated Biomass	1994 Commercial Harvest	Percent by Weight	1995 Forecast Biomass	Percent by Weight
1					
2	4.4	0.0	0.00		
3	9.0	0.0	0.00	1,507	6.85
4	499.4	30.4	1.40	0	0.00
5	748.3	65.9	3.04	628	2.85
6	9,811.6	961.9	44.40	1,067	4.85
7	2,811.6	233.9	10.80	13,612	61.88
8	1,649.9	184.7	8.52	1,911	8.69
9	2,169.9	140.7	6.49	675	3.07
10	4,103.1	303.5	14.01	387	1.76
11	2,524.1	167.8	7.74	1,289	5.86
12	361.2	26.8	1.24	556	2.53
13	401.8	19.0	0.88	40	0.18
14	120.5	18.0	0.83	179	0.81
15	96.2	7.6	0.35	78	0.35
16	33.0	6.5	0.30	69	0.31
TOTALS	25,344.0	2,166.7	100.00	21,998	100.00

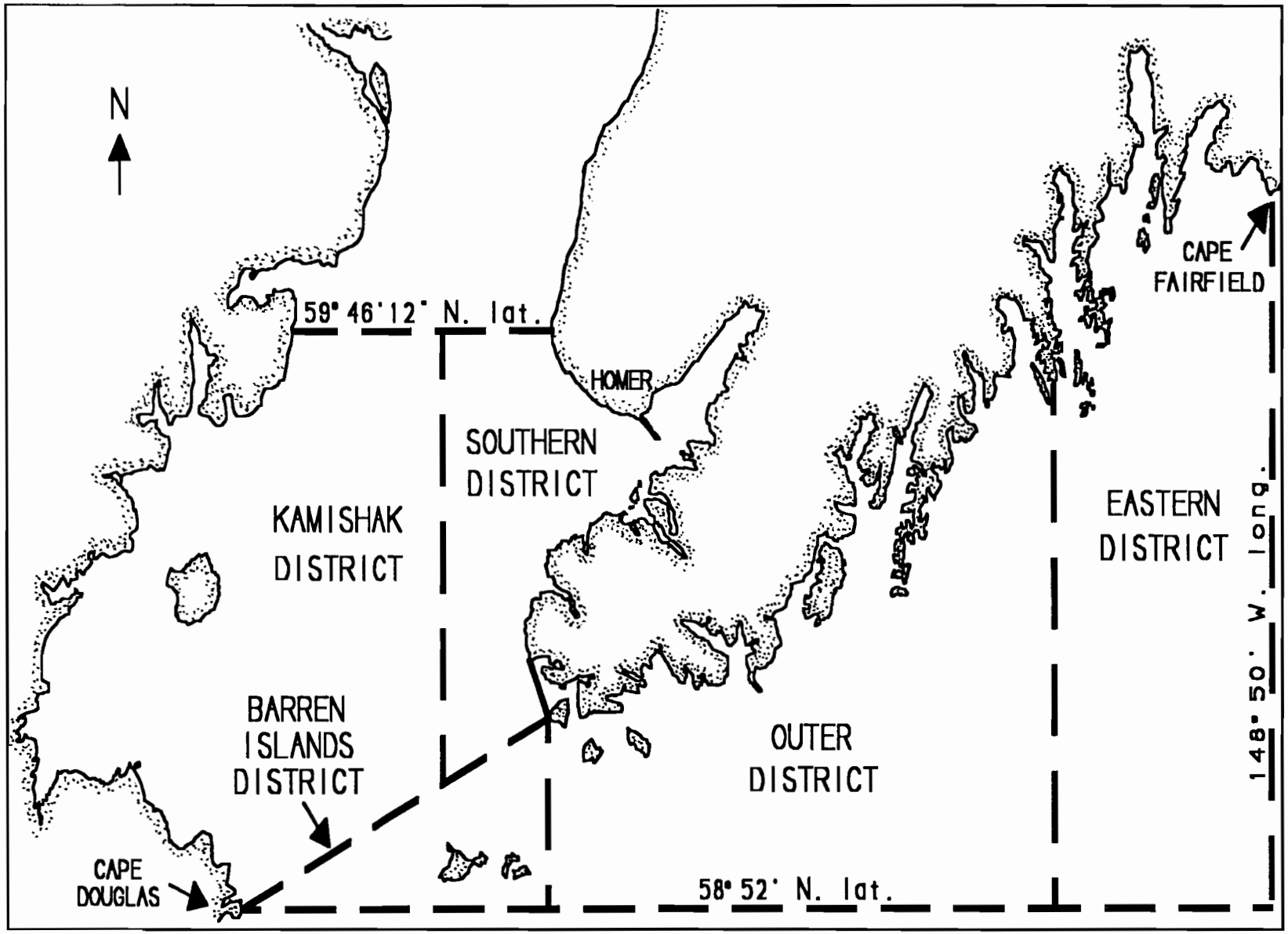

Figure 1. Lower Cook Inlet salmon and herring management area (not drawn to scale).

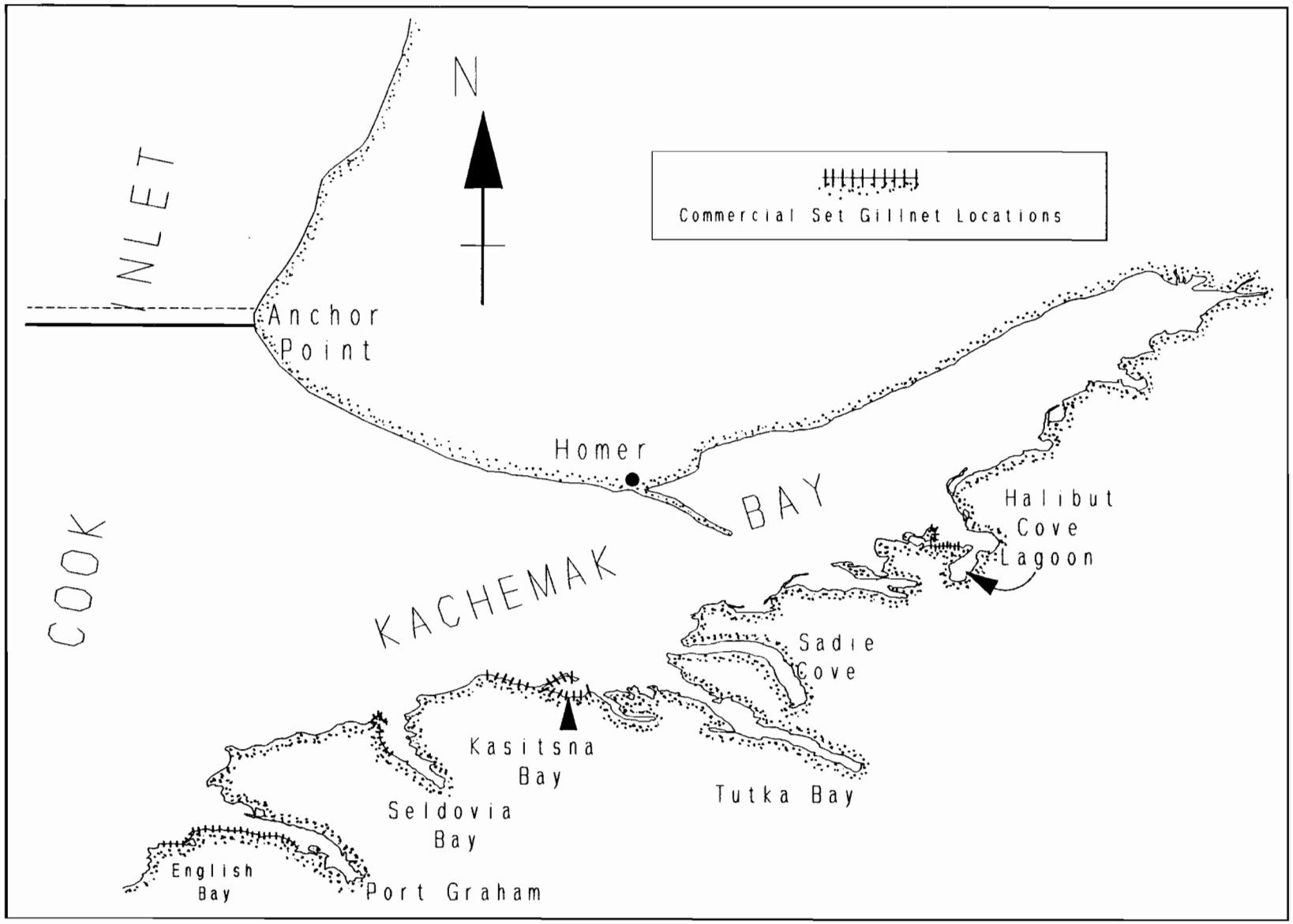

Figure 2. Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

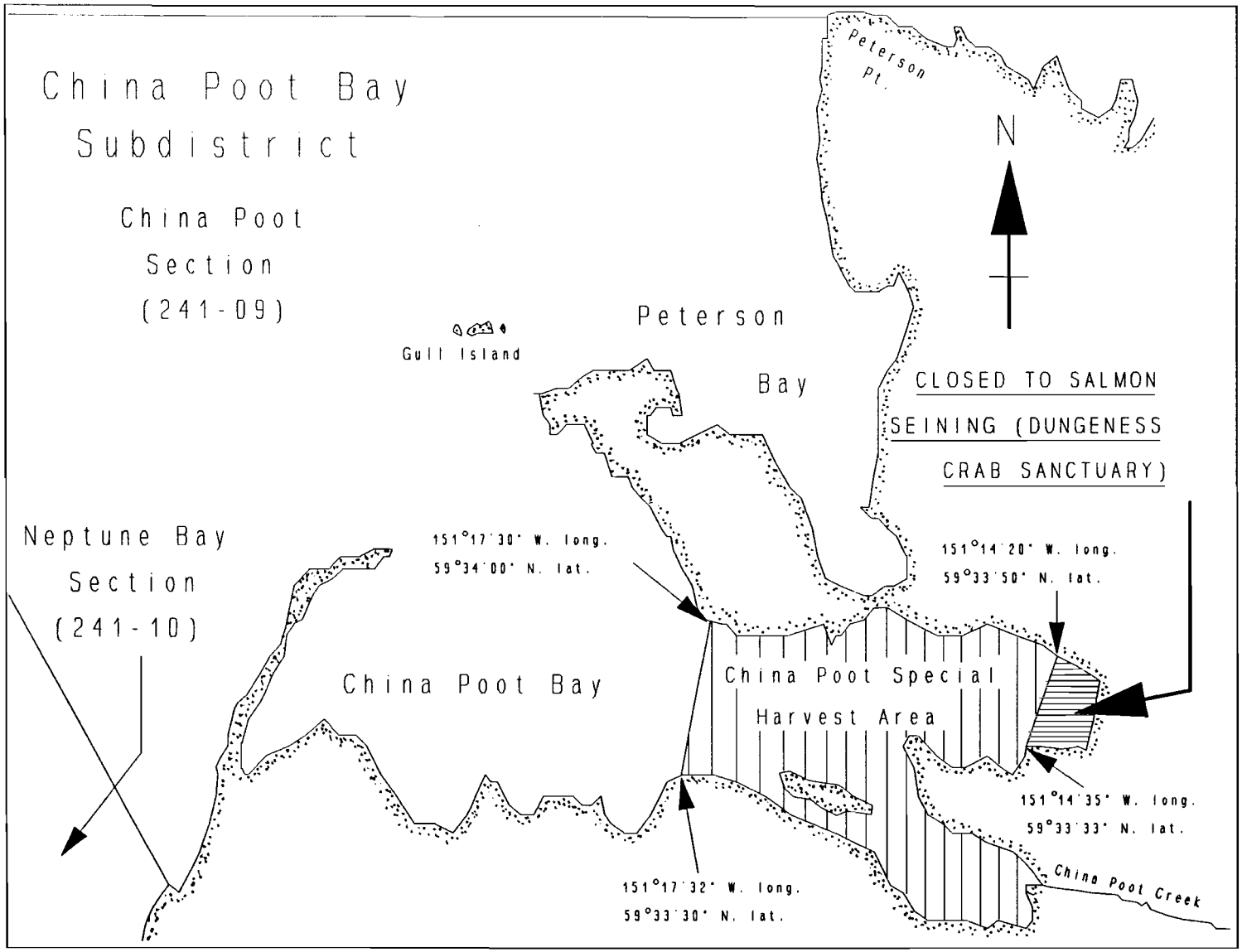

Figure 3. China Poot Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

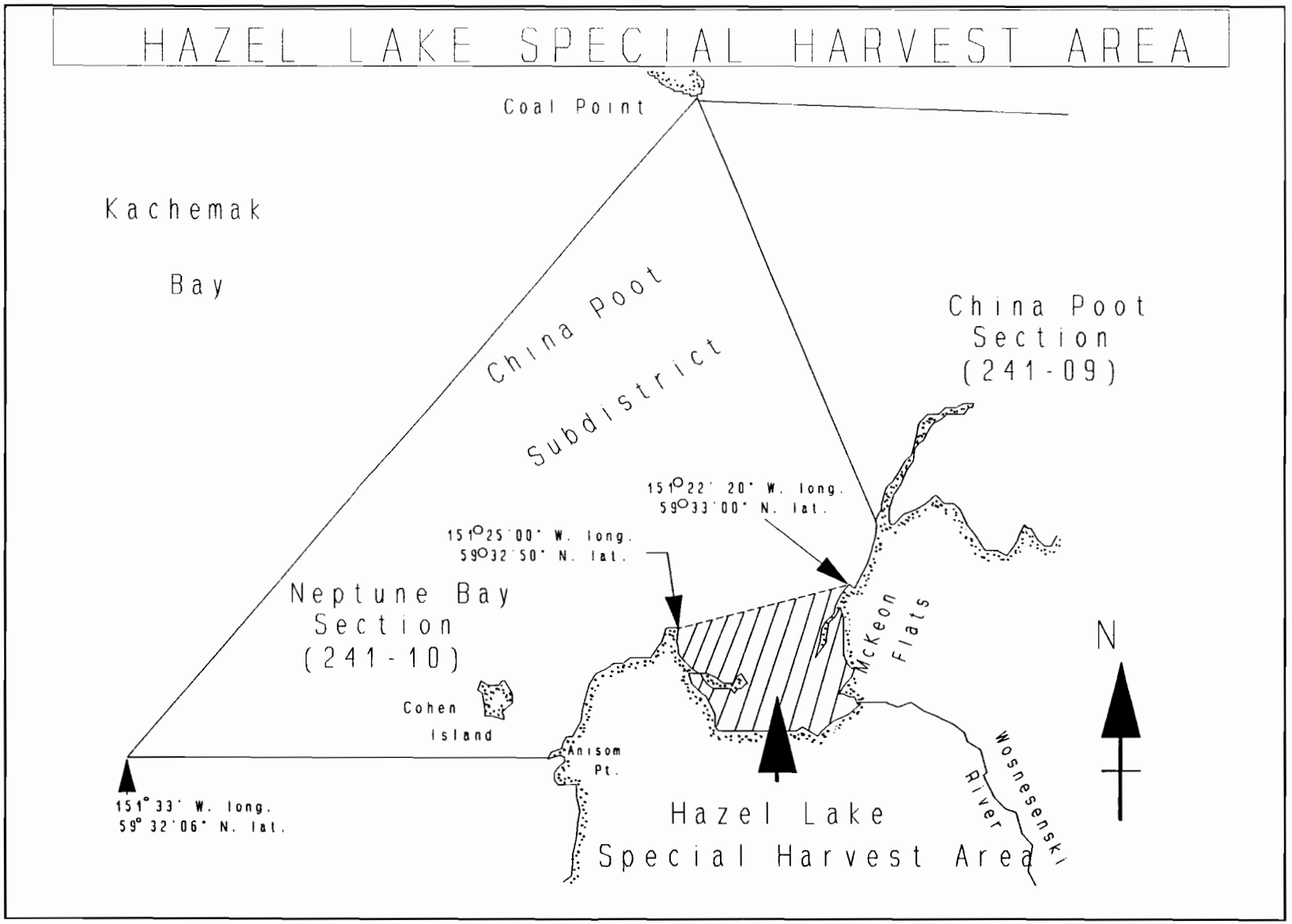

Figure 4. Hazel Lake Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

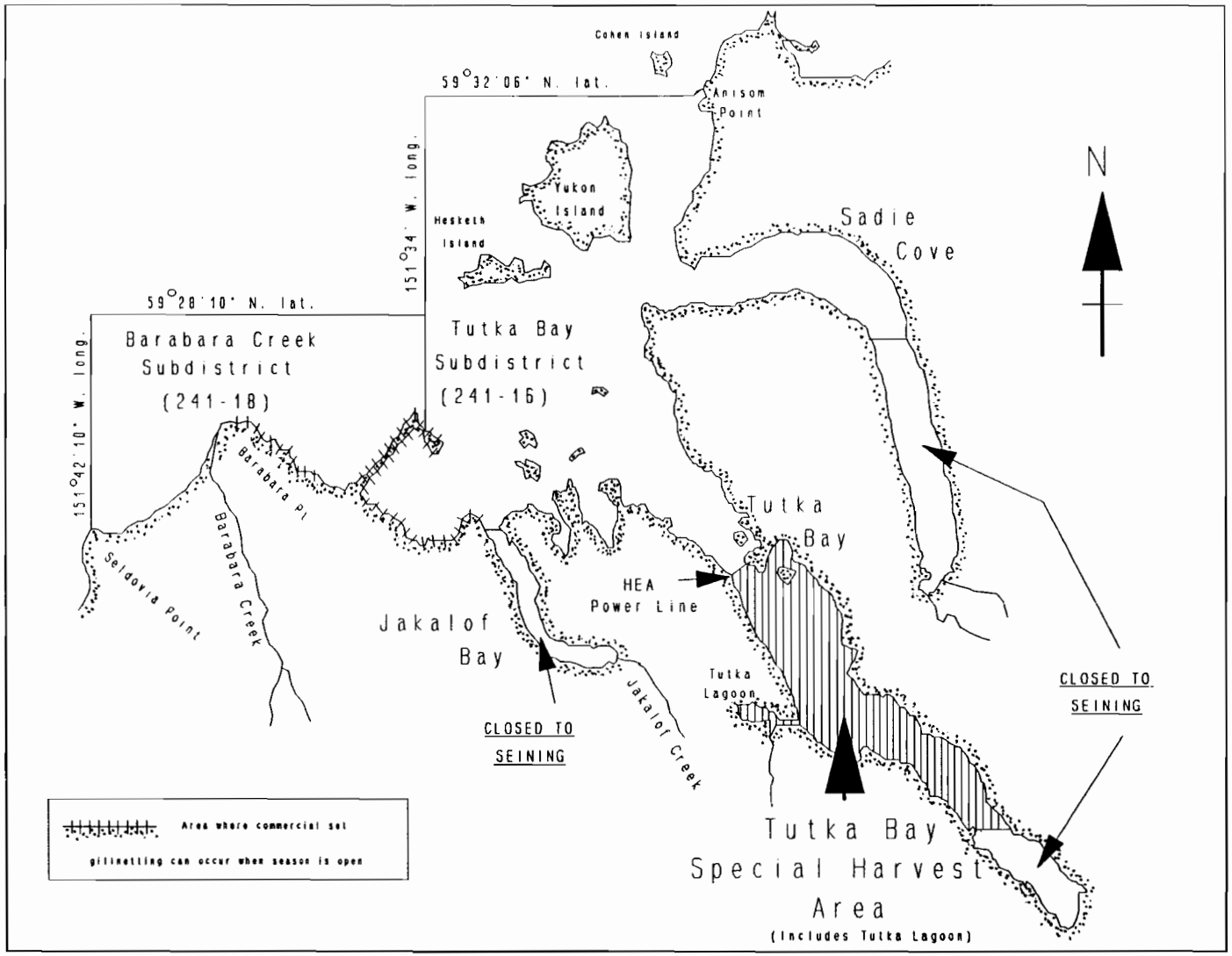

Figure 5. Tutka Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

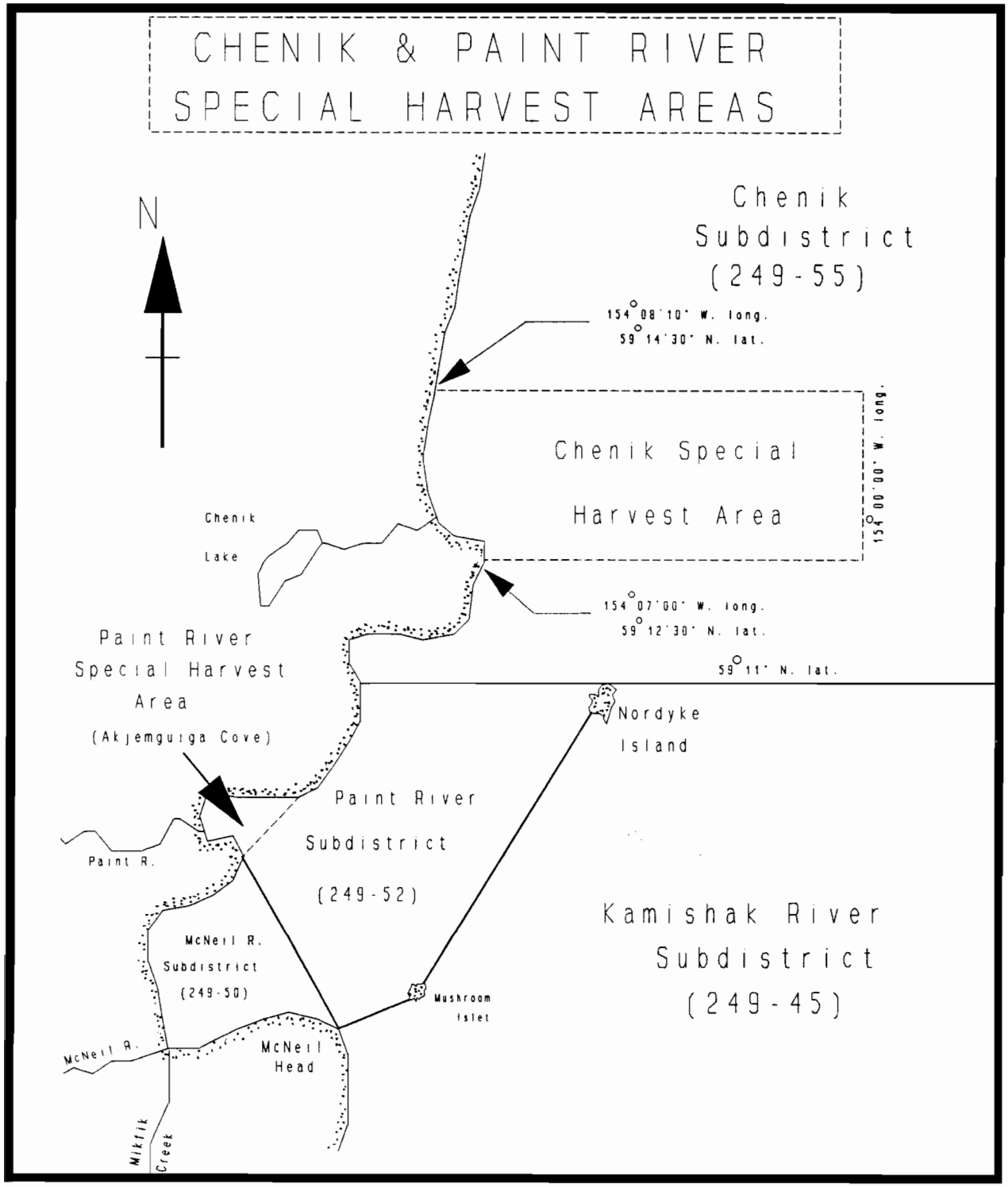

Figure 6. Chenik and Paint River Special Harvest Areas for salmon hatchery cost recovery in the Kamishak Bay District of Lower Cook Inlet.

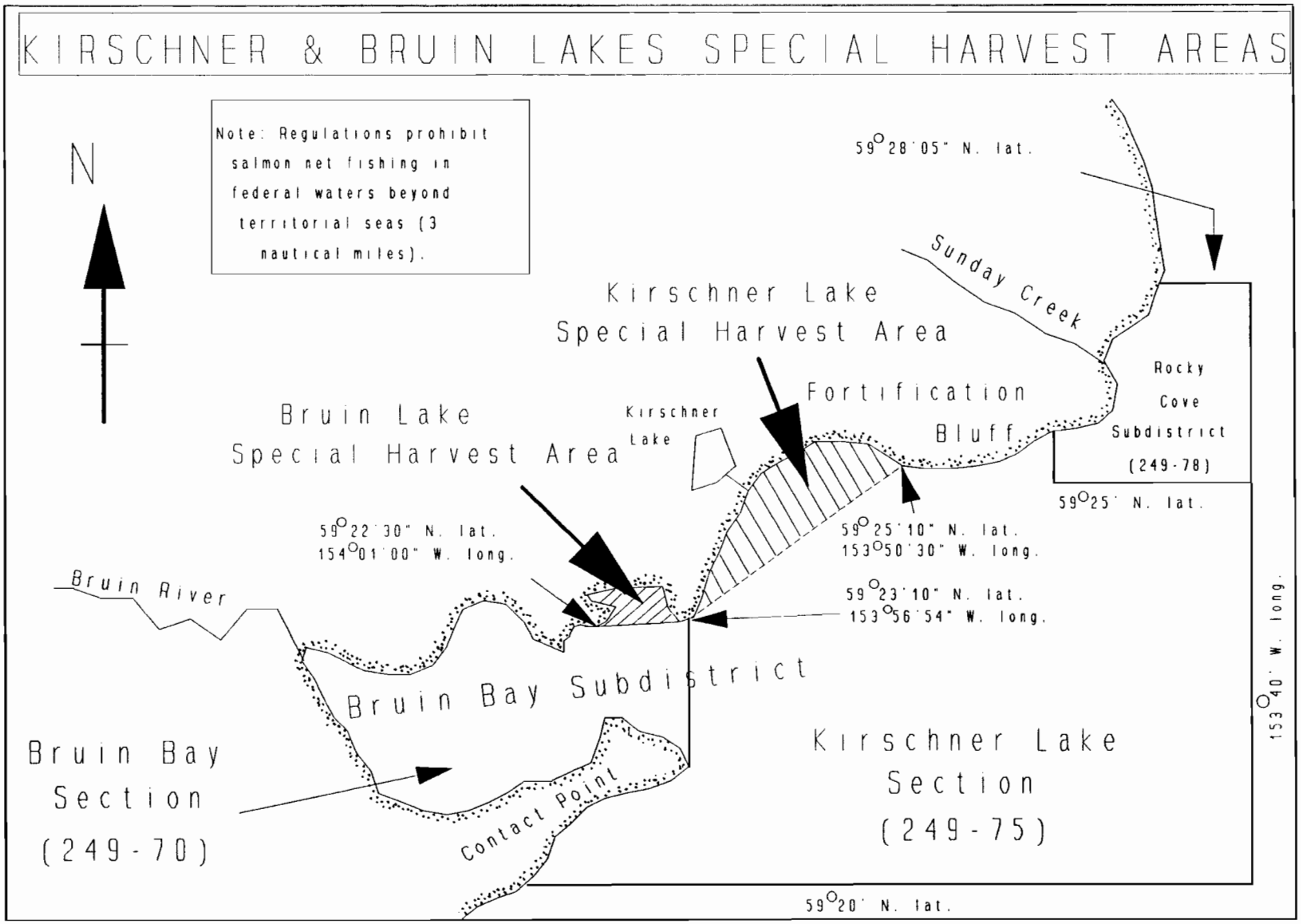

Figure 7. Kirschner and Bruin Lakes Special Harvest Areas for salmon hatchery cost recovery in the Kamishak Bay District of Lower Cook Inlet.

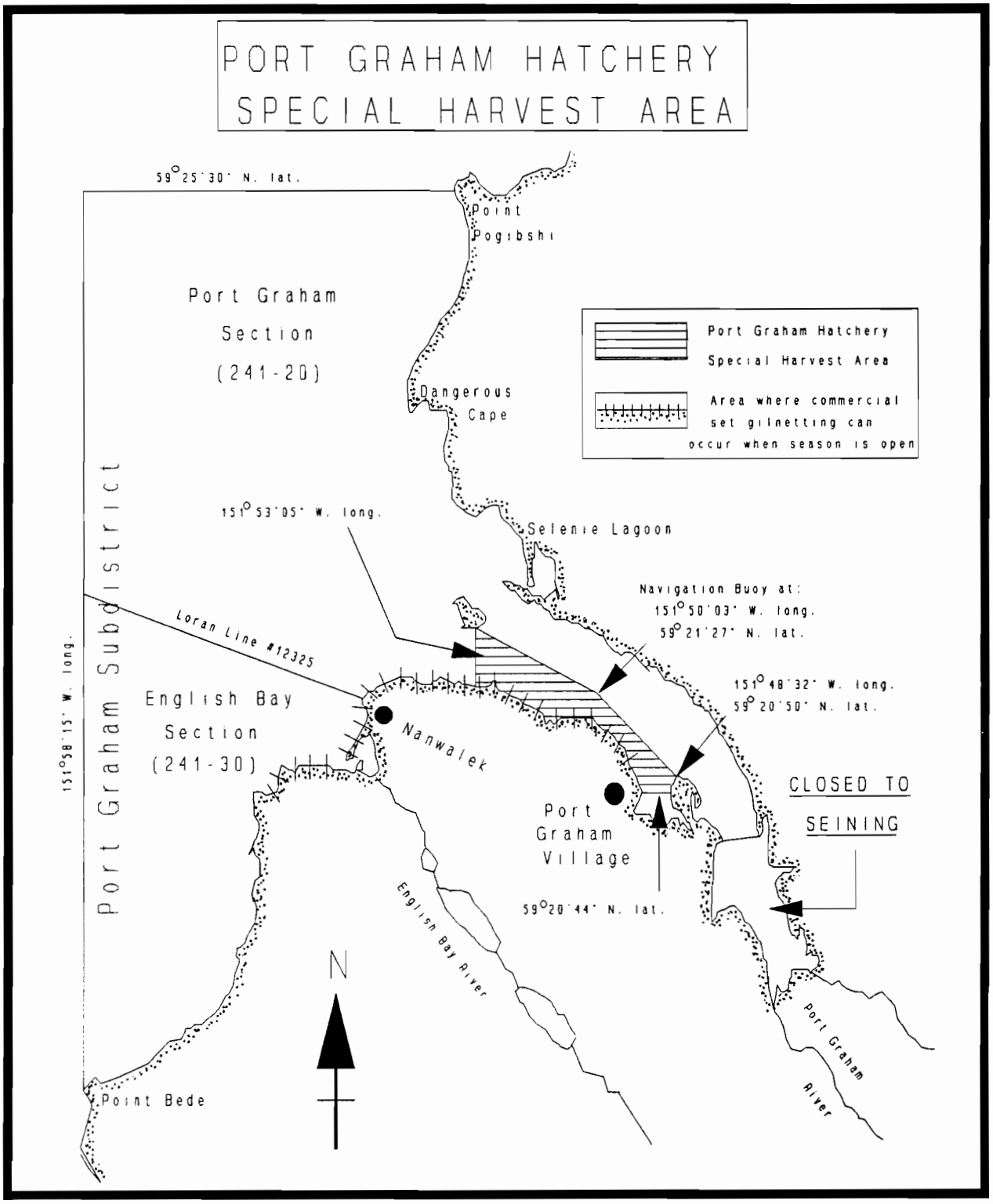

Figure 8. Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

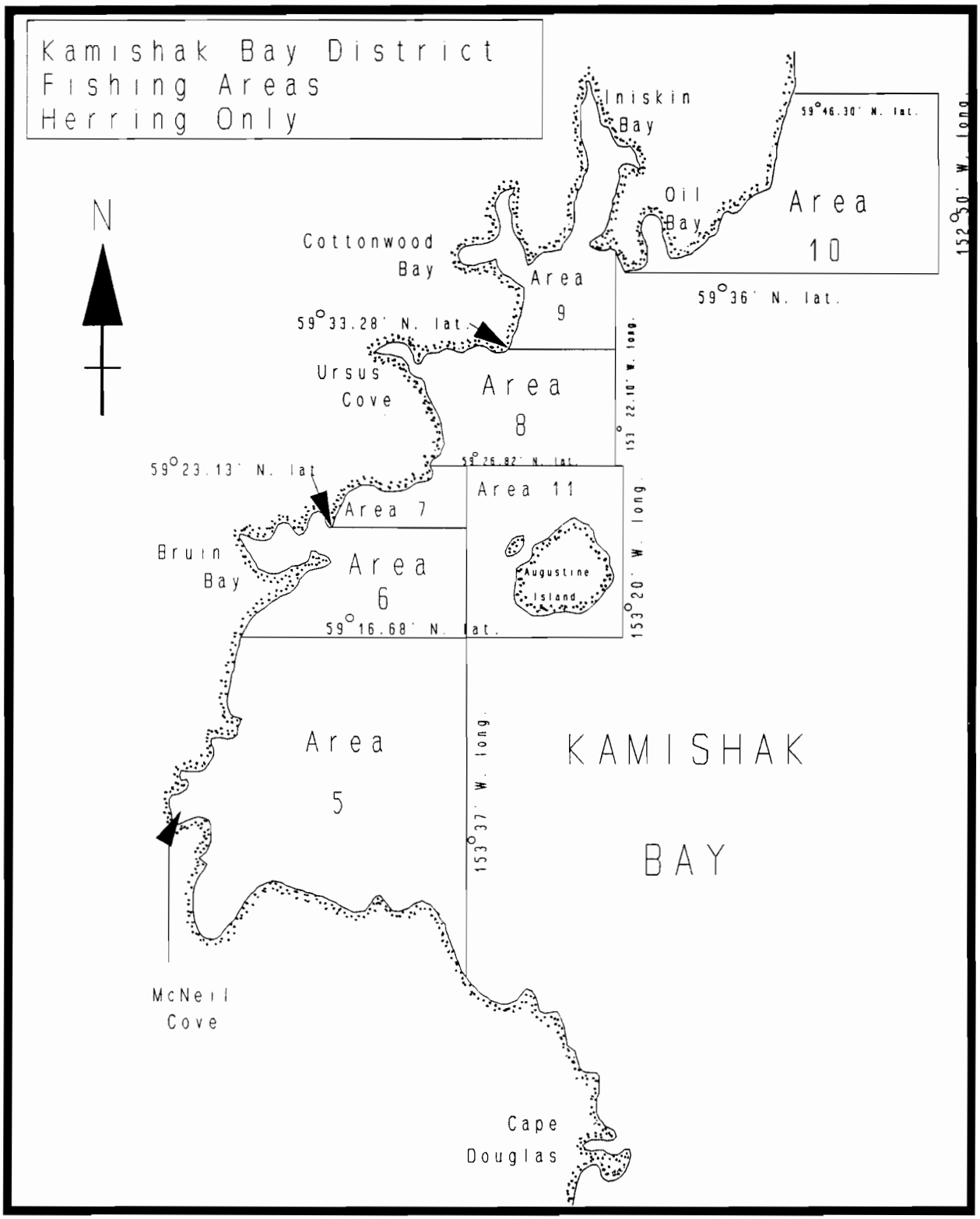

Figure 9. Commercial herring fishing areas in the Kamishak Bay District of the Lower Cook Inlet management area.

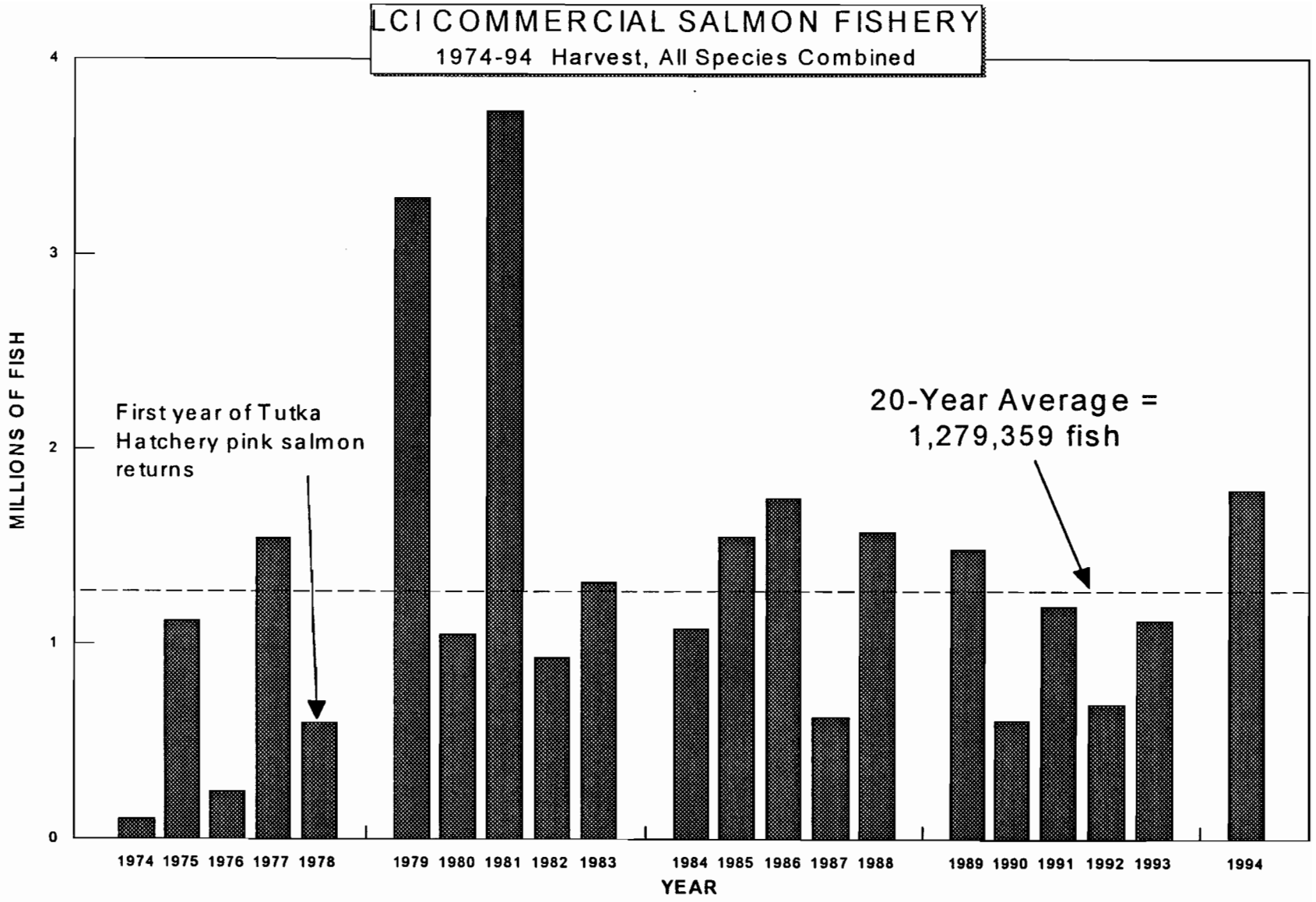

Figure 10. Total commercial salmon catch, Lower Cook Inlet, 1974 - 1994.

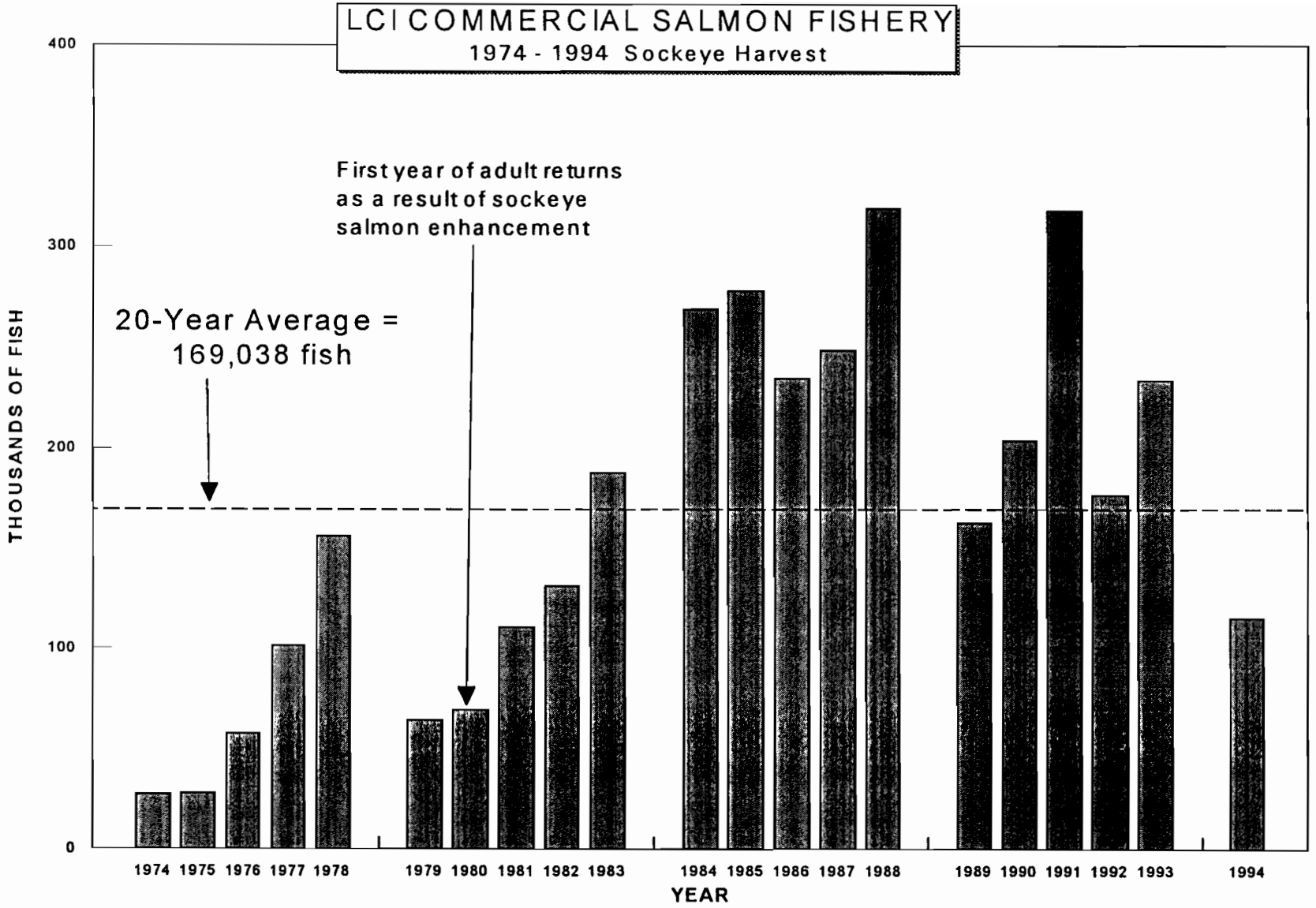

Figure 11. Commercial sockeye salmon catch, Lower Cook Inlet, 1974 - 1994.

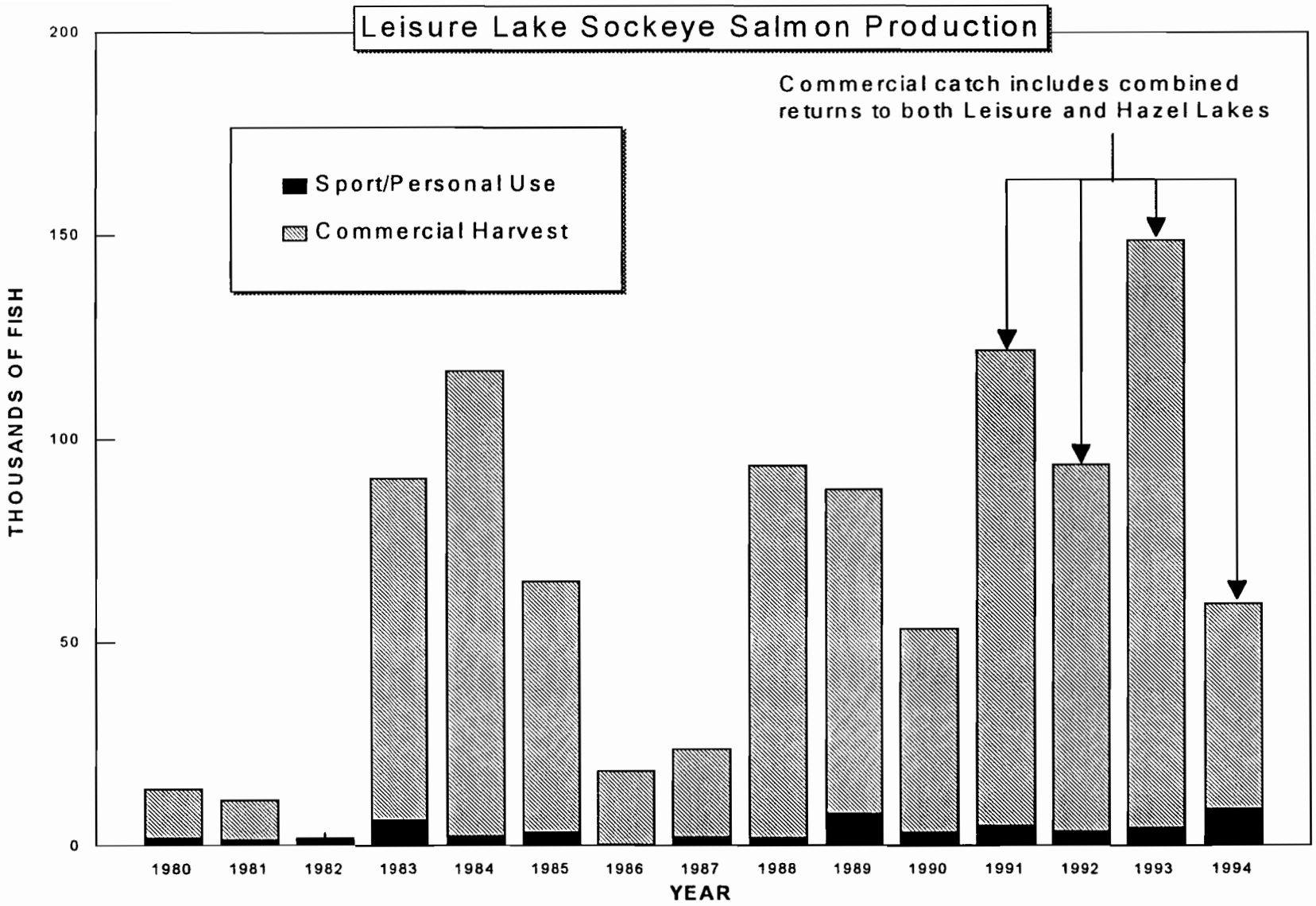

Figure 12. Sockeye salmon returns to Leisure Lake in the Southern District of Lower Cook Inlet, 1980 - 1994.

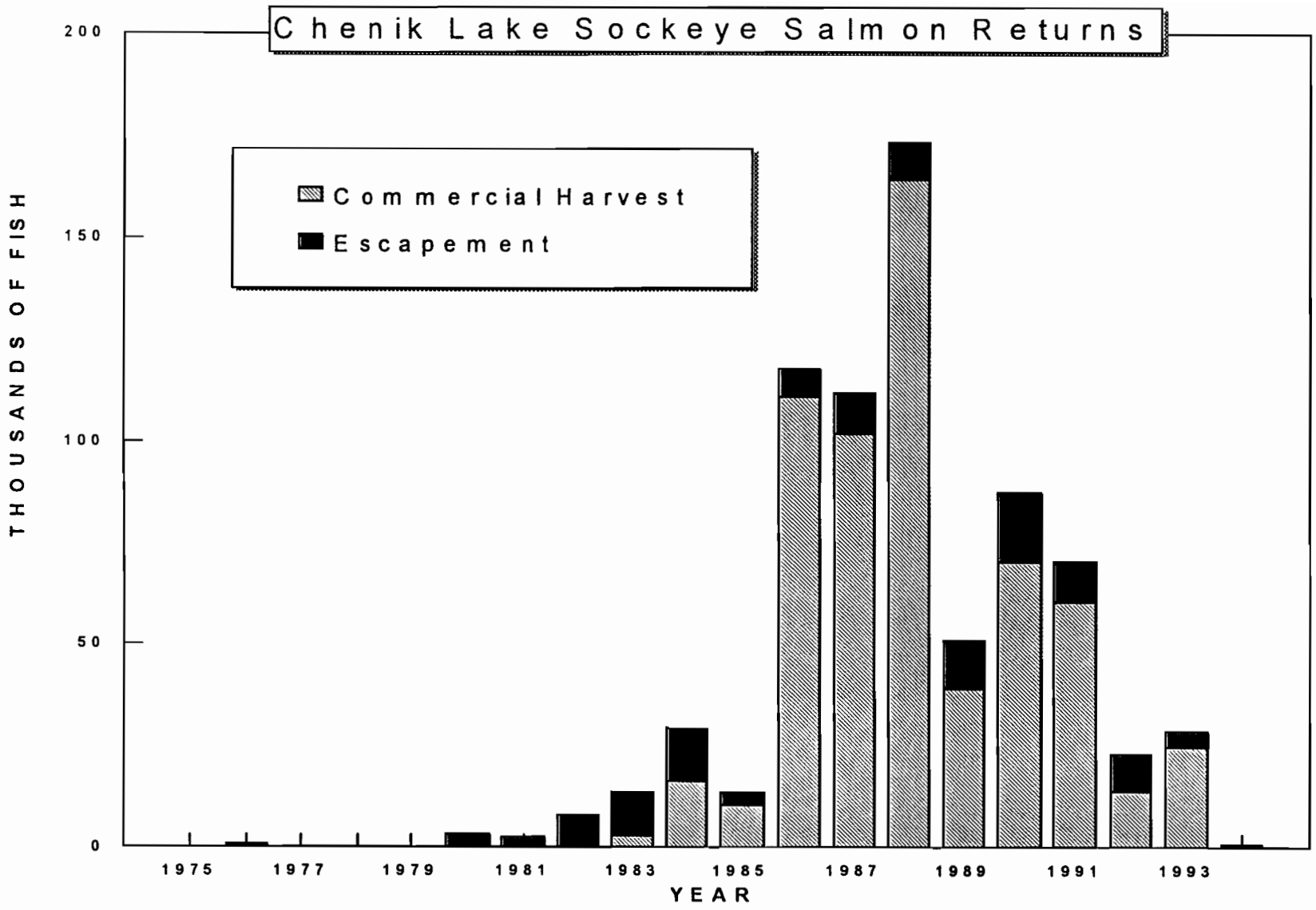

Figure 13. Sockeye salmon returns to Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975 - 1994.

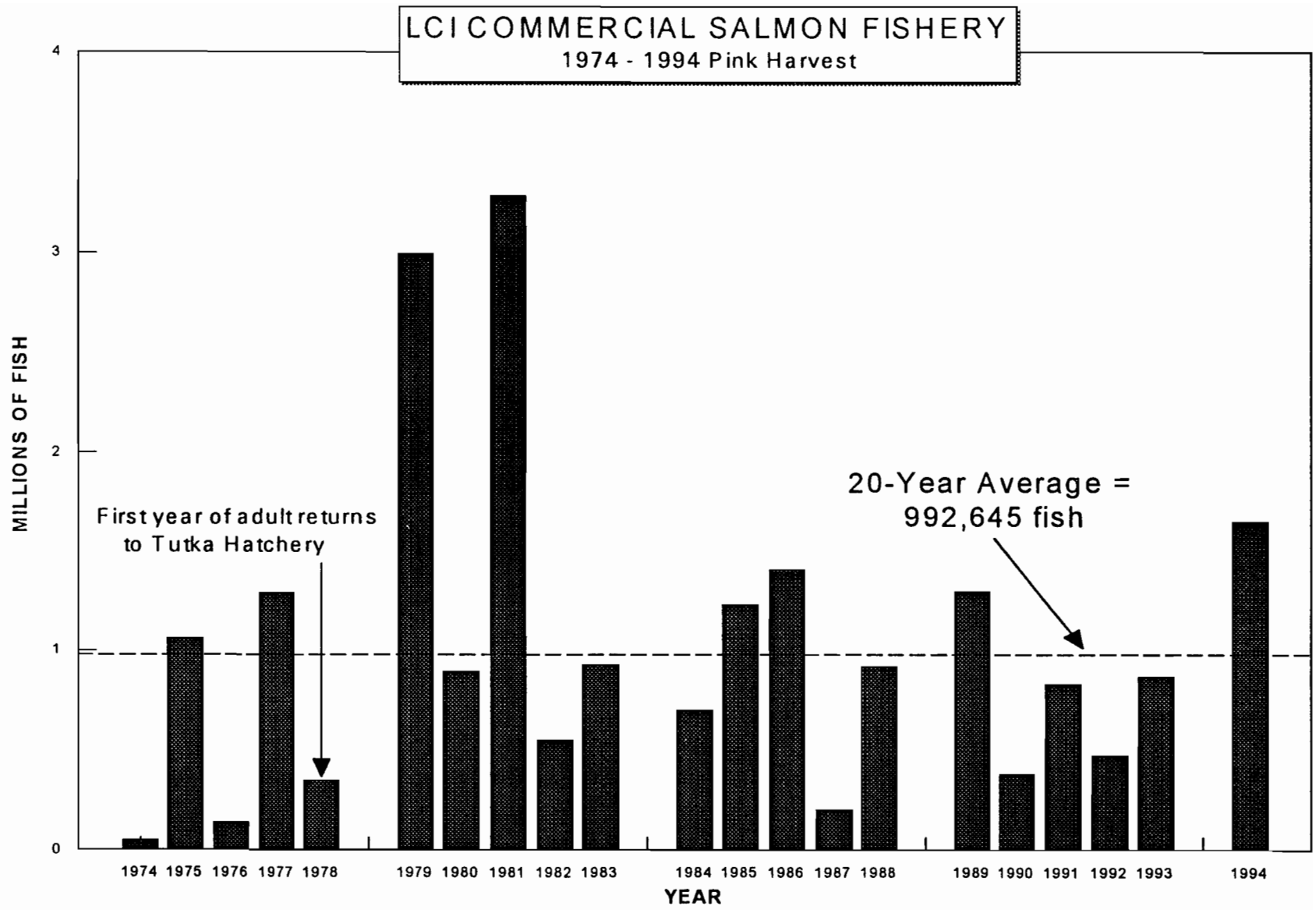

Figure 14. Commercial pink salmon catch, Lower Cook Inlet, 1974 - 1994.

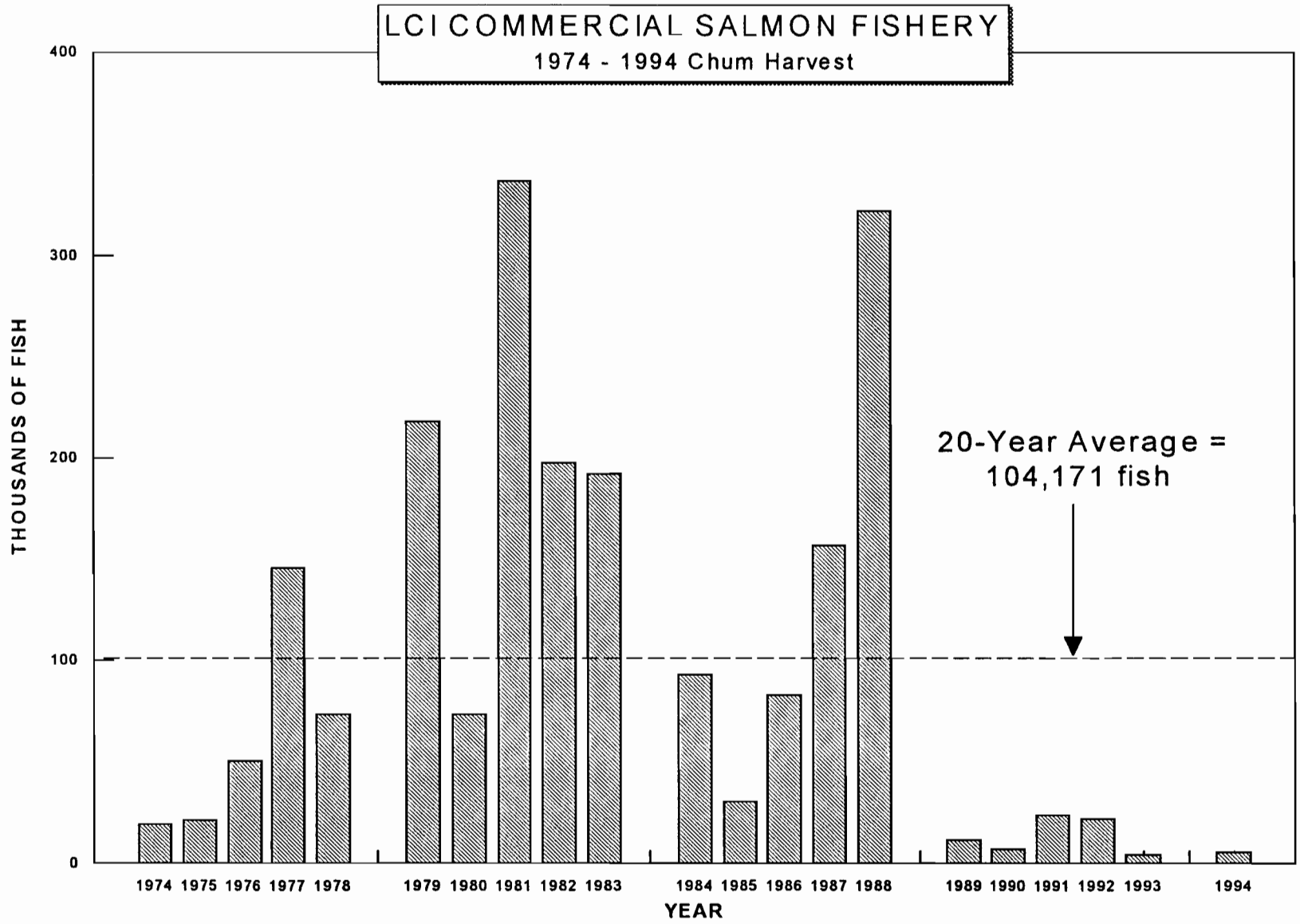

Figure 15. Commercial chum salmon catch, Lower Cook Inlet, 1974 - 1994.

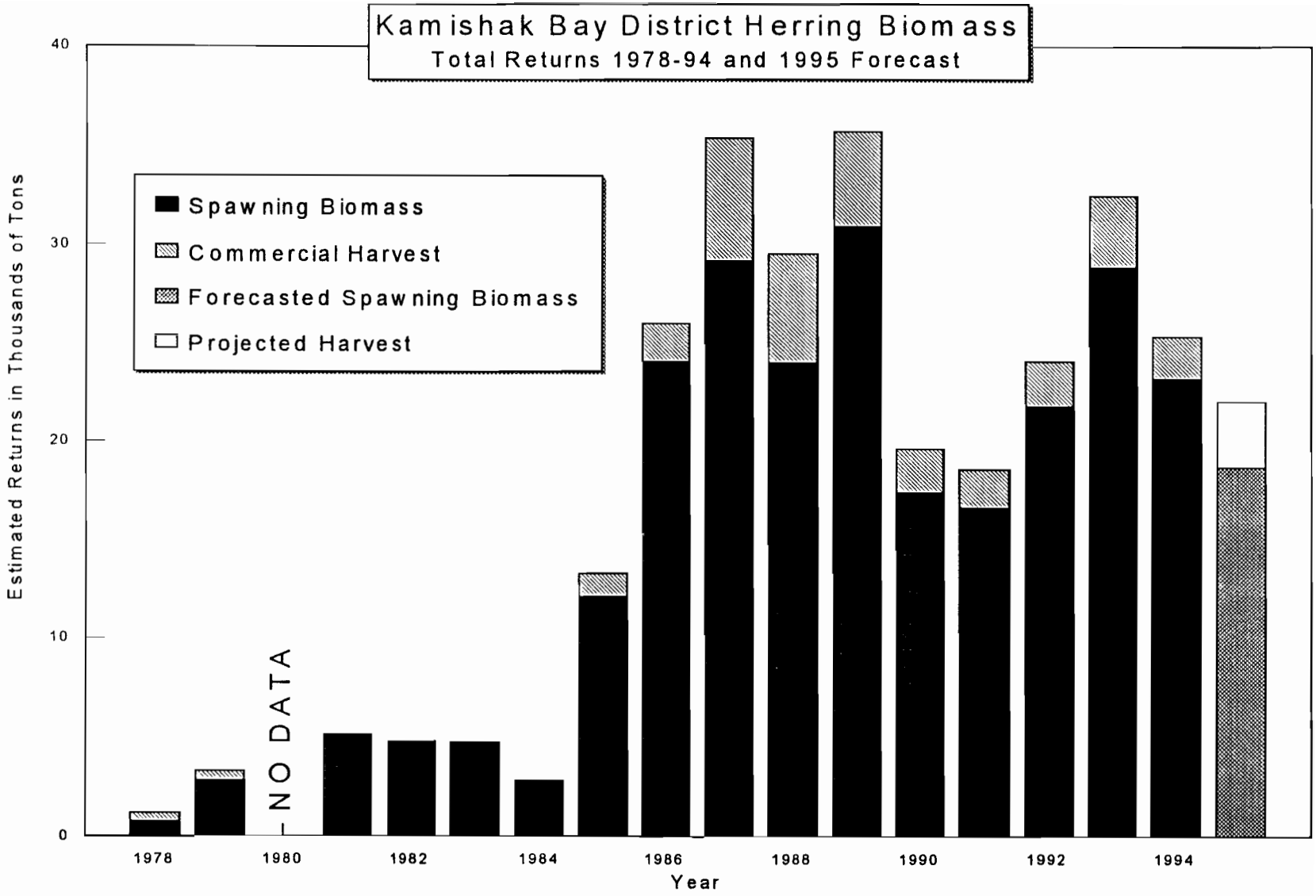

Figure 16. Biomass estimates and commercial harvests of Pacific herring in the sac roe seine fishery, Kamishak Bay District, Lower Cook Inlet, 1978 - 1994, and 1995 projection.

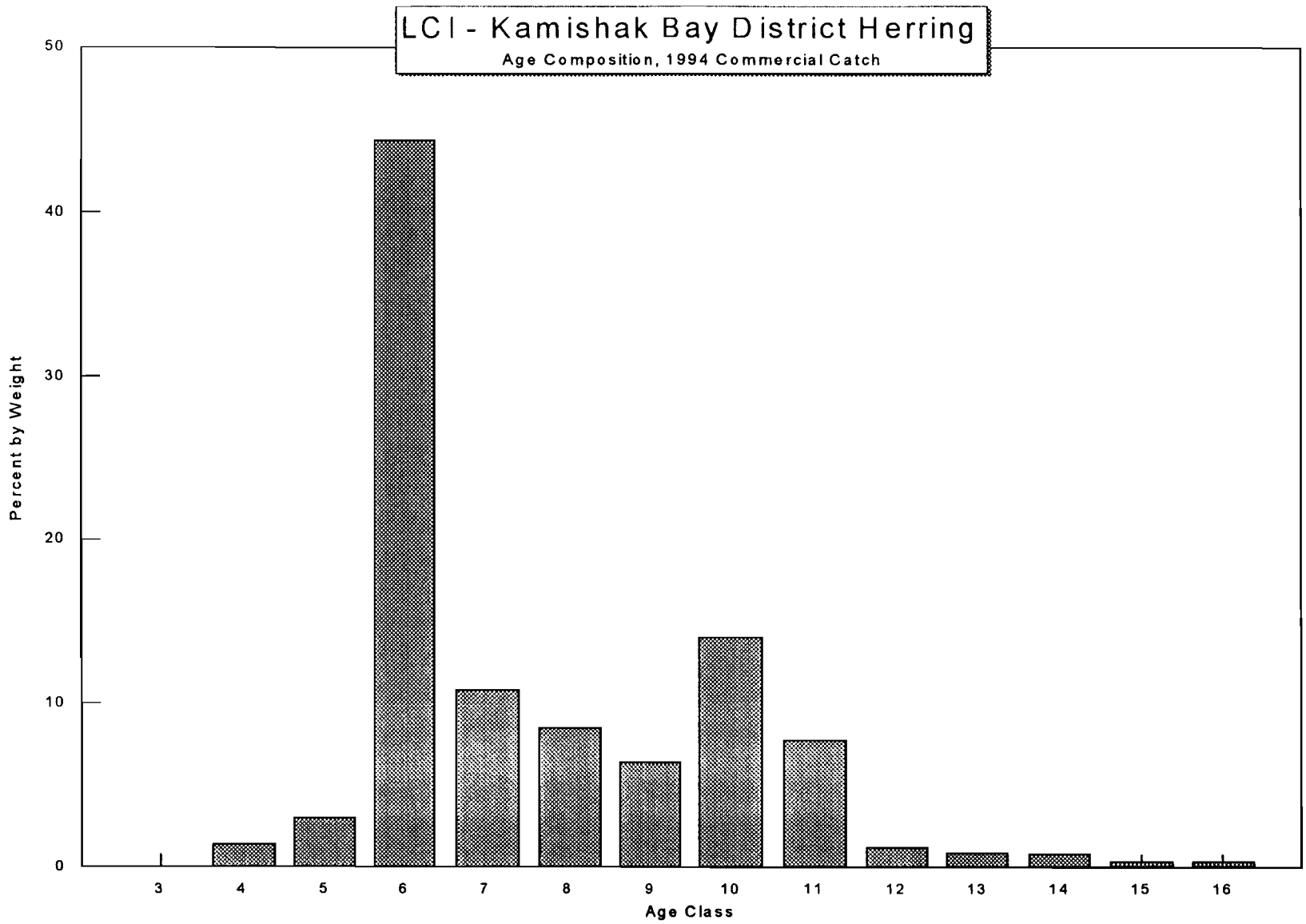

Figure 17. Weighted age class composition of the Pacific herring commercial sac roe harvest, Kamishak Bay District, Lower Cook Inlet, 1994.

Appendix Table 1. Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1975 - 1994[a].

Year	Purse Seines				Set Nets Fished
	Permanent Permit	Interim Permit	Total Issued	Actively Fished	
1975	49	51	100	63	27
1976	63	16	79	53	25
1977	72	10	82	72	26
1978	74	9	83	72	39
1979	75	9	84	75	38
1980	75	9	84	83	40
1981	75	10	85	85	40
1982	77	7	84	69	39
1983	78	5	83	83	24
1984	78	3	81	54	35
1985	80	1	81	51	34
1986	79	0	79	62	34
1987	79	0	79	66	29
1988	79	0	79	71	27
1989	83	0	83	64	23
1990	82	1	83	71	20
1991	82	1	83	68	20
1992	82	1	83	63	21
1993	82	1	83	51	17
1994	82	1	83	32	16
1975-93 Average	76	7	83	67	29

[a] Data source: Commercial Fisheries Entry Commission and ADF&G fish ticket database.

Appendix Table 2. Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	5	283	30	100	77	495
1975	3	106	27	1,456	71	1,663
1976	7	287	13	207	217	731
1977	7	620	9	1,719	604	2,959
1978	62	1,516	52	370	341	2,341
1979	36	621	68	4,495	1,097	6,317
1980	12	336	64	1,196	298	1,906
1981	18	740	69	5,334	1,346	7,507
1982	28	827	367	406	820	2,448
1983	20	704	57	696	513	1,990
1984	23	1,393	120	635	242	2,413
1985	47	1,637	86	974	78	2,822
1986	21	1,414	132	1,245	201	3,013
1987	27	1,951	118	295	598	2,989
1988	32	3,812	127	2,237	2,548	8,756
1989	33	1,213	59	1,660	39	3,004
1990	29	1,287	28	306	31	1,681
1991	19	1,115	36	275	48	1,495[b]
1992	30	1,151	20	213	52	1,466[b]
1993	27	802	41	287	7	1,164[b]
1994	18	496	93	766	9	1,382[b]
1974-93 Average	24	1,056	74	1,206	474	2,835

[a] Values obtained by using the formula: (average price per lb.) x (average weight of fish) x (catch) = Exvessel value; average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.
[b] Includes hatchery cost recovery.

Appendix Table 3. Average salmon price in dollars per pound by species, Lower Cook Inlet, 1974 - 1994.[a]

Year	Chinook	Sockeye	Coho	Pink	Chum
1974	0.76	1.54	0.72	0.48	0.56
1975	0.61	0.61	0.49	0.37	0.43
1976	0.91	0.77	0.59	0.37	0.48
1977	1.07	0.86	0.55	0.35	0.45
1978	1.09	1.31	0.97	0.30	0.54
1979	1.54	1.53	0.89	0.43	0.60
1980	1.30	0.88	0.85	0.42	0.52
1981	1.35	1.10	0.75	0.44	0.49
1982	1.29	1.05	0.87	0.23	0.46
1983	1.00	0.75	0.70	0.25	0.29
1984	1.29	1.05	0.77	0.26	0.28
1985	1.60	1.25	0.85	0.22	0.31
1986	1.25	1.40	0.85	0.26	0.30
1987	1.25	1.60	1.00	0.42	0.46
1988	1.25	2.50	1.80	0.80	0.84
1989	1.25	1.60	0.70	0.40	0.40
1990	1.35	1.55	0.60	0.30	0.50
1991	1.12	0.83	0.29	0.13	0.27
1992	1.29	1.47	0.43	0.14	0.27
1993	1.02	0.80	0.54	0.12	0.28
1994	0.95	1.06	0.62	0.15	0.25
20-Year Average	1.18	1.21	0.75	0.34	0.44
1974-83 Average	1.09	1.04	0.74	0.36	0.48
1984-93 Average	1.27	1.41	0.78	0.31	0.39

[a] Average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

Appendix Table 4. Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum
1974	36.1	6.7	6.4	4.1	7.2
1975	33.2	6.2	8.8	3.7	7.6
1976	16.1	6.4	7.0	4.1	8.9
1977	30.1	7.2	5.9	3.8	9.2
1978	32.3	7.4	8.2	3.5	8.6
1979	18.9	6.3	6.2	3.5	8.2
1980	21.7	5.5	5.2	3.2	7.8
1981	12.5	6.1	8.5	3.7	8.1
1982	20.6	6.0	9.0	3.2	9.0
1983	22.8	5.0	7.2	3.0	9.2
1984	28.8	4.7	8.8	3.5	8.9
1985	28.0	4.7	9.8	3.5	8.2
1986	20.6	4.3	8.6	3.4	8.1
1987	18.1	4.9	8.2	3.5	8.3
1988	15.3	4.8	8.9	3.0	9.4
1989	14.1	4.6	7.0	3.1	8.6
1990	13.8	4.1	7.1	2.8	8.9
1991	12.3	4.2	6.6	2.6	7.5
1992	12.3	4.4	7.7	3.2	8.8
1993	12.0	4.3	6.0	2.7	6.1
1994	15.0	4.1	10.2	3.0	6.4
1974-93 Average	21.0	5.6	7.6	3.4	8.4

[a] Values obtained from commercial fish catch & production statistical leaflets (1971-74); remaining years from ADF&G fish ticket database.

Appendix Table 5. Commercial salmon catch in numbers of fish by species, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	183	27,428	6,514	50,601	19,210	103,936
1975	142	28,142	6,211	1,063,338	21,646	1,119,479
1976	450	58,159	3,216	136,445	50,822	249,092
1977	217	101,597	1,798	1,293,932	145,789	1,543,333
1978	1,747	156,404	6,529	352,561	73,518	590,759
1979	1,238	64,417	12,393	2,990,929	218,490	3,287,467
1980	424	69,442	14,505	889,703	73,492	1,047,566
1981	1,086	110,255	10,776	3,279,183	336,093	3,737,393
1982	1,066	131,320	46,892	551,589	198,185	929,052
1983	873	187,645	11,219	927,607	192,319	1,319,663
1984	714	268,950	16,797	700,622	92,540	1,079,623
1985	1,043	278,694	10,327	1,229,708	30,640	1,550,412
1986	796	234,861	18,852	1,408,293	82,688	1,745,490
1987	1,179	248,848	14,354	201,429	157,018	622,828
1988	1,694	319,008	7,946	921,296	321,911	1,571,855
1989	1,893	163,271	12,089	1,296,926	11,305	1,485,484
1990	1,560	203,895	9,297	383,670	6,951	605,373
1991	1,419	317,947	19,047	828,709	24,232	1,191,354
1992	1,891	176,644	5,902	479,768	22,203	686,408
1993	2,168	233,834	13,477	866,774	4,367	1,120,620
1994	1,231	115,418	14,673	1,647,929	5,469	1,784,720
20-Year Avg.	1,089	169,038	12,407	992,654	104,171	1,279,359
1974-83 Avg.	743	93,481	12,005	1,153,589	132,956	1,392,774
1984-93 Avg.	1,436	244,595	12,809	831,720	75,386	1,165,945
'94 % of Ttl.	0.07	6.47	0.82	92.34	0.31	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 6. Commercial salmon catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	182	27,029	3,054	48,875	2,752	81,865
1975	142	27,393	3,039	893,615	5,428	929,617
1976	442	35,280	1,905	99,817	1,517	138,961
1977	182	54,663	1,255	157,025	6,734	219,859
1978	1,511	141,088	4,318	251,761	5,525	404,203
1979	1,199	37,342	10,846	986,909	8,221	1,044,517
1980	414	42,929	11,568	478,019	4,605	537,535
1981	1,024	77,880	7,976	1,453,982	20,920	1,561,782
1982	926	43,433	7,165	296,556	18,466	366,546
1983	858	133,671	3,433	690,254	14,281	842,497
1984	661	160,654	3,193	336,595	8,065	509,168
1985	1,007	84,149	4,258	518,889	5,513	613,816
1986	776	36,838	3,095	542,521	5,560	588,790
1987	1,158	89,662	2,163	90,522	5,030	188,535
1988	1,655	105,302	2,987	852,382	7,742	970,068
1989	1,889	98,052	6,667	987,488	3,141	1,097,237
1990	1,546	82,412	1,552	178,087	2,433	266,030
1991	1,399	170,224	9,415	253,962	1,962	436,962
1992	1,852	106,793	1,277	417,021	1,885	528,828
1993	2,162	159,747	4,431	692,794	2,788	861,922
1994	1,230	64,531	1,373	1,589,709	2,631	1,659,474
20-Year Avg.	1,049	85,727	4,680	511,354	6,627	609,437
1974-83 Avg.	688	62,071	5,456	535,681	8,842	612,738
1984-93 Avg.	1,411	109,383	3,904	487,026	4,412	606,738
'94 % of Ttl.	0.07	3.89	0.08	95.80	0.16	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 7. Commercial salmon set gillnet catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	175	26,996	3,010	11,097	2,713	43,991
1975	96	26,588	2,337	49,490	4,020	82,531
1976	176	33,993	1,321	13,412	1,353	50,255
1977	175	54,404	869	38,064	2,765	96,277
1978	1,052	86,934	3,053	11,556	4,117	106,712
1979	483	34,367	7,595	69,368	5,266	117,079
1980	225	29,922	8,038	26,613	2,576	67,374
1981	222	53,665	6,735	68,794	8,524	137,940
1982	894	42,389	5,557	15,838	7,113	71,791
1983	822	41,707	1,799	20,533	4,377	69,238
1984	639	40,987	2,862	17,836	5,008	67,332
1985	958	23,188	3,908	22,898	4,221	55,173
1986	745	21,807	2,827	14,244	2,426	42,049
1987	653	28,209	2,025	9,224	2,419	42,530
1988	1,145	14,758	2,819	29,268	4,423	52,413
1989	1,281	13,970	4,792	16,210	1,877	38,130
1990	1,361	15,863	1,046	12,646	1,938	32,854
1991	842	20,525	5,011	3,954	1,577	31,909
1992	1,288	17,002	848	15,958	1,687	36,783
1993	1,089	14,791	3,088	12,008	2,591	33,567
1994	1,103	14,004	1,073	23,621	2,419	42,220
20-Year Avg.	716	32,103	3,477	23,951	3,550	63,796
1974-83 Avg.	432	43,097	4,031	32,477	4,282	84,319
1984-93 Avg.	1,000	21,110	2,923	15,425	2,817	43,274
'94 % of Ttl.	2.61	33.17	2.54	55.95	5.73	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 8. Commercial salmon catch in numbers of fish by species in the Outer District, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	1	206	21	1,300	11,924	13,452
1975	0	124	7	159,908	11,348	171,387
1976	7	18,886	0	93	412	19,398
1977	34	33,733	78	1,129,250	70,167	1,233,262
1978	236	10,695	45	70,080	19,224	100,280
1979	30	25,297	135	1,945,536	180,558	2,151,556
1980	10	22,514	16	154,041	32,246	208,827
1981	61	18,133	485	1,714,115	238,393	1,971,187
1982	129	66,781	92	67,523	631075	197,600
1983	14	16,835	54	199,794	27,203	243,900
1984	3	29,276	41	89,085	3,204	121,609
1985	19	91,957	3,210	618,222	11,844	725,252
1986	6	48,472	5,052	401,755	11,701	466,986
1987	14	31,845	2,481	23,890	28,663	86,893
1988	5	9,501	2	6,094	71,202	86,804
1989	1	10,286	72	52,677	43	63,079
1990	2	17,404	74	191,320	614	209,414
1991	2	6,408	12	359,664	14,337	380,423
1992	0	572	1	146	181	900
1993	2	4,613	119	159,159	970	164,863
1994	0	5,930	993	13,200	32	20,155
20-Year Avg.	29	23,177	600	367,183	39,865	430,854
1974-83 Avg.	52	21,320	93	544,164	65,455	631,085
1984-93 Avg.	5	25,033	1,106	190,201	14,276	230,622
'94 % of Ttl.	0.00	29.42	4.93	65.49	0.16	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 9. Commercial salmon catch in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	0	193	524	378	7	1,102
1975	0	596	124	383	2	1,105
1976	0	5	200	35,423	45	35,673
1977	0	5,776	360	1,349	3,229	10,714
1978	0	2	582	29,738	100	30,422
1979	0	0	296	0	0	296
1980	0	122	426	155,799	720	157,047
1981	0	9,270	470	44,989	3,279	58,088
1982	0	3,092	950	143,639	7,698	155,379
1983	0	25,932	594	36,154	7,934	70,614
1984	47	54,420	536	136,797	10,535	202,335
1985	11	24,338	835	92,403	5,144	122,731
1986	0	3,055	770	40,243	3,757	47,825
1987	0	3,687	1,631	14,333	14,913	34,564
1988	1	20,253	486	1,740	24,668	47,148
1989	0	8,538	5,346	92	312	14,288
1990	0	7,682	7,645[b]	11,815	307	27,449
1991	1	4,703	7,283[b]	167,250	80	179,317
1992	0	432	3,136[b]	60,007	86	63,661
1993	0	1,824	8,924[b]	10,616	9	21,373
1994	1	9,661	10,410[b]	44,987	2,792	67,851
20-Year Avg.	3	8,696	2,056	49,156	4,141	64,053
1974-83 Avg.	0	4,499	453	44,783	2,301	52,036
1984-93 Avg.	6	12,893	3,659	53,530	5,981	76,069
'94 % of Ttl.	0.00	14.24	15.34	66.30	4.11	100.00

[a] Data source: ADF&G fish ticket database.
[b] Includes commercial seine catches, Seward Silver Salmon Derby entries, and fish taken for hatchery cost recovery purposes.

Appendix Table 10. Commercial salmon catch in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1974 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1974	0	0	2,915	48	4,554	7,517
1975	0	29	3,041	9,432	4,868	17,370
1976	1	3,988	1,111	1,112	48,848	55,060
1977	1	7,425	105	6,308	65,659	79,498
1978	0	4,619	1,584	982	48,669	55,854
1979	9	1,778	1,116	58,484	29,711	91,098
1980	0	3,877	2,495	101,864	35,921	144,157
1981	1	4,972	1,845	66,097	73,501	146,416
1982	11	18,014	38,685	43,871	108,946	209,527
1983	1	11,207	7,138	1,405	142,901	162,652
1984	3	24,600	13,027	138,145	70,736	246,511
1985	6	78,250	2,024	194	8,139	88,613
1986	14	146,496	9,935	423,774	61,670	641,889
1987	7	123,654	8,079	72,684	108,412	312,836
1988	33	183,952	4,471	61,080	218,299	467,835
1989	3	46,395	4	256,669	7,809	310,880
1990	12	96,397	26	2,448	3,597	102,480
1991	17	136,612	2,337	47,833	7,853	194,652
1992	39	68,847	1,488	2,594	20,051	93,019
1993	4	67,650	3	4,205	600	72,462
1994	0	35,296	1,897	33	14	37,240
20-Year Avg.	8	51,438	5,071	64,961	53,537	175,016
1974-83 Avg.	2	5,591	6,004	28,960	56,358	96,915
1984-93 Avg.	14	97,285	4,139	100,963	50,717	253,118
'94 % of Ttl.	0.00	94.78	5.09	0.09	0.04	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 11. Total commercial salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	81,865	13,452	7,517	1,102	103,936
1975	929,617	171,387	17,370	1,105	1,119,479
1976	138,961	19,398	55,060	35,673	249,092
1977	219,859	1,233,262	79,498	10,714	1,543,333
1978	404,203	100,280	55,854	30,422	590,759
1979	1,044,517	2,151,556	91,098	296	3,287,467
1980	537,535	208,827	144,157	157,047	1,047,566
1981	1,561,782	1,971,187	146,416	58,088	3,737,393
1982	366,546	197,600	209,527	155,379	929,052
1983	842,497	243,900	162,652	70,614	1,319,663
1984	509,168	121,609	246,511	202,335	1,079,623
1985	613,816	725,252	88,613	122,731	1,550,412
1986	588,790	466,986	641,889	47,825	1,745,490
1987	188,535	86,893	312,836	34,564	622,828
1988	970,068	86,804	467,835	47,148	1,571,855
1989	1,097,237	63,079	310,880	14,288	1,485,484
1990	266,030	209,414	102,480	27,449	605,373
1991	436,962	380,423	194,652	179,317	1,191,354
1992	528,828	900	93,019	63,661	686,408
1993	861,922	164,863	72,462	21,373	1,120,620
1994	1,659,474	20,155	37,240	67,851	1,784,720
20-Year Avg.	609,437	430,854	175,016	64,053	1,279,359
1974-83 Avg.	612,738	631,085	96,915	52,036	1,392,774
1984-93 Avg.	606,136	230,622	253,118	76,069	1,165,945
'94 % of Ttl.	92.98	1.13	2.09	3.80	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 12. Commercial chinook salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	182	1	0	0	183
1975	142	0	0	0	142
1976	442	7	1	0	450
1977	182	34	1	0	217
1978	1,511	236	0	0	1,747
1979	1,199	30	9	0	1,238
1980	414	10	0	0	424
1981	1,024	61	1	0	1,086
1982	926	129	11	0	1,066
1983	858	14	1	0	873
1984	661	3	3	47	714
1985	1,007	19	6	11	1,043
1986	776	6	14	0	796
1987	1,158	14	7	0	1,179
1988	1,655	5	33	1	1,694
1989	1,889	1	3	0	1,893
1990	1,546	2	12	0	1,560
1991	1,399	2	17	1	1,419
1992	1,852	0	39	0	1,891
1993	2,162	2	4	0	2,168
1994	1,230	0	0	1	1,231
20-Year Avg.	1,049	29	8	3	1,089
1974-83 Avg.	688	52	2	0	743
1984-93 Avg.	1,411	5	14	6	1,436
'94 % of Ttl.	99.92	0.00	0.00	0.08	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 13. Commercial sockeye salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	27,029	206	0	193	27,428
1975	27,393	124	29	596	28,142
1976	35,280	18,886	3,988	5	58,159
1977	54,663	33,733	7,425	5,776	101,597
1978	141,088	10,695	4,619	2	156,404
1979	37,342	25,297	1,778	0	64,417
1980	42,929	22,514	3,877	122	69,442
1981	77,880	18,133	4,972	9,270	110,255
1982	43,433	66,781	18,014	3,092	131,320
1983	133,671	16,835	11,207	25,932	187,645
1984	160,654	29,276	24,600	54,420	268,950
1985	84,149	91,957	78,250	24,338	278,694
1986	36,838	48,472	146,496	3,055	234,861
1987	89,662	31,845	123,654	3,687	248,848
1988	105,302	9,501	183,952	20,253	319,008
1989	98,052	10,286	46,395	8,538	163,271
1990	82,412	17,404	96,397	7,682	203,895
1991	170,224	6,408	136,612	4,703	317,947
1992	106,793	572	68,847	432	176,644
1993	159,747	4,613	67,650	1,824	233,834
1994	64,531	5,930	35,296	9,661	115,418
20-Year Avg.	85,727	23,177	51,438	8,696	169,038
1974-83 Avg.	62,071	21,320	5,591	4,499	93,481
1984-93 Avg.	109,383	25,033	97,285	12,893	244,595
'94 % of Ttl.	55.91	5.14	30.58	8.37	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 14. Commercial sockeye salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 - 1994[a].

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Resurrection Bay	0	0.1	0	0	0	0	0	0	0	74.5	99.4	1.8	2.2
Aialik Bay	1.3	0.2	4.3	2.6	0.5	0	0	0	0	0	0	3.1	0
Nuka Bay	8.3	6.7	8.2	5.1	0.5	0	2.0	0	2.2	1.5	0	1.0	1.6
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove/Lagoon	1.3	1.4	0.8	2.0	1.1	0.7	1.4	1.5	1.9	2.7	1.7	1.3	1.3
Tutka/Barabara	1.1	1.7	3.0	5.2	2.9	9.0	5.2	6.0	11.8	6.3	5.6	6.0	10.0
Seldovia Bay	0.4	1.2	1.2	1.7	1.2	2.1	0.9	1.0	2.2	1.9	1.1	1.2	1.5
Port Graham Bay	6.6	7.8	5.2	6.8	7.8	5.5	3.5	2.7	10.4	7.7	4.3	3.7	5.6
Kamishak/Douglas	0	0	0	0	0	0	0	0	0	0	0	0	0
McNeil (Mikfik)	0	0.7	0	0	0	1.9	0.2	0	0	0	8.9	2.8	0
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0.2	0	1.9	0	0
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	2.6	4.9	0.1	1.9	1.1	1.5	0.8	4.1	0.3	0.6	0.1	0	0
Totals	21.6	24.7	22.8	25.3	15.1	20.7	14.0	15.3	29.0	95.2	122.8	20.9	22.2

Location	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Resurrection Bay	0.1	0	0	0	0	0	0	0	0	0.6	0	0	3.4
Aialik Bay	0.3	3.1	0.2	0.6	0	5.8	0	0	0.1	8.7	3.0	25.9	50.8
Nuka Bay	26.1	1.1	0.1	0	18.9	31.1	10.6	24.4	21.5	17.2	66.3	16.8	29.2
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove/Lagoon	3.7	2.1	3.0	3.4	5.1	3.6	12.9	5.3	11.5	11.2	1.2	77.7	116.6
Tutka/Barabara	14.8	8.1	10.8	12.6	14.2	21.3	92.1	15.6	13.2	41.0	15.8	35.9	26.7
Seldovia Bay	2.3	2.2	2.3	2.1	2.1	3.0	5.6	2.6	1.6	5.3	5.0	6.7	4.9
Port Graham Bay	10.5	11.7	10.9	9.2	13.6	16.6	30.5	12.9	16.5	20.3	21.5	13.4	12.5
Kamishak/Douglas	0	0	0	0	0.2	5.3	4.6	0.5	0	4.9	0	2.8	0
McNeil (Mikfik)	0	0	0	0	3.8	2.1	0	1.2	3.9	0	17.8	5.8	10.7
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0	0	0.3	2.7	13.9
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.1	0.8	0.1	0.2	0.3	2.8	0.1	1.9	1.1	1.1	0.4	0	0.3
Totals	57.9	29.1	27.4	28.1	58.2	101.6	156.4	64.4	69.4	110.3	131.3	187.6	269.0

Location	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Resurrection Bay	0.3	0	0.2	0	0	0	0	0	1.7	9.0			
Aialik Bay	24.1	3.0	3.5	20.2	8.5	7.7	4.7	0.4	0.2	0.6			
Nuka Bay	91.8	48.4	31.8	9.5	10.3	5.7	1.8	0	3.5	5.9			
Port Dick	0	0	0	0	0	11.7	4.6	0.6	1.0	0			
Halibut Cove/Lagoon	63.2	15.2	69.1	24.9	46.6	20.3	36.0	14.7	19.0	12.2			
China Poot[b]				63.6	35.8	49.9	116.7	76.0	127.6	38.7			
Tutka/Barabara	14.9	16.3	14.7	12.9	13.4	7.9	13.4	12.9	8.4	11.0			
Seldovia Bay	2.6	3.2	3.5	2.5	1.8	4.3	4.0	3.3	4.4	2.7			
Port Graham Bay	3.5	2.0	2.4	1.4	0	0	0	0	0	0			
Kamishak/Douglas	0.7	7.6	2.3	5.0	0	0.1	7.0	9.9	1.3	3.4			
McNeil (Mikfik)	67.0	27.5	21.4	14.6	7.0	9.1	12.9	4.0	0.9	0			
Paint River	0	0	0	0	0	0	0.4	0	0	0			
Chenik Lake	10.6	111.3	98.5	164.2	38.9	70.3	60.4	14.4	24.6	0			
Bruin (Kirschner)	0	0	0	0	0.2	14.5	55.9	40.5	39.7	31.9			
Miscellaneous	0	0.4	1.6	0.2	0.8	2.4	0.1	0	1.5	0			
Totals	278.7	234.9	248.8	319.0	163.3	203.9	317.9	176.6	233.8	115.4			

[a] Data source: ADF&G fish ticket database.

[b] China Poot was part of Halibut Cove Subdistrict prior to 1988; includes China Poot, Peterson, and Neptune Bays.

Appendix Table 15. Harvest of sockeye salmon returns to China Poot Bay in the Southern District of Lower Cook Inlet, by user group, 1979 - 1994.

Return Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Total Return[a]
1979	650	0	[b]	650
1980	1,000	1,000	12,000	14,000
1981	1,500	0	10,000	11,500
1982	450	1,320	200	3,400
1983	480	5,910	84,020	90,420
1984	500	2,000	114,360	117,360
1985	500	3,000	61,500	65,920
1986	100	150	18,350	18,800
1987	200	2,000	21,500	23,700
1988	500	1,500	91,469	93,939
1989	1,000	7,000	79,714	87,714
1990	500	3,000	49,587[c]	53,087
1991	1,000	4,000	117,000[c,d]	122,000[d]
1992	300	3,500	89,791[c,d]	93,951[d]
1993	400	4,000	144,677[c,d]	149,077[d]
1994	500	8,500	50,527[c,d]	59,527[d]
1979-93 Average	620	2,456	53,535	56,863

[a] Total return includes estimated escapements (i.e. non-harvested fish).
[b] No data.
[c] Portions of the commercial sockeye harvest in China Poot Bay, Halibut Cove, and Tutka Bay Subdistricts were attributed to the Leisure and/or Hazel Lakes returns.
[d] Includes returns to both Leisure and Hazel Lakes.

Appendix Table 16. Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975 - 1994.

Return Year	Escapement[a]	Harvest	Total Return
1975	100	[b]	100
1976	900	[b]	900
1977	200	[b]	200
1978	100	[b]	100
1979	[c]	[b]	[b]
1980	3,500	[b]	3,500
1981	2,500	[b]	2,500
1982	8,000	[b]	8,000
1983	11,000	2,800	13,800
1984	13,000	16,500	29,500
1985	3,500	10,500	14,000
1986	7,000	111,000	118,000
1987	10,000	102,000	112,000
1988	9,000	164,200	173,200
1989	12,000[d]	38,905	50,905
1990	17,000	70,347	87,347
1991	10,189[d]	60,397	70,586
1992	9,269[d]	14,378	23,647
1993	4,000[d]	24,567	28,567
1994	808[d]	0[e]	808
Avg. Since 1985	9,106	66,190	75,296

[a] Estimated from aerial surveys unless otherwise noted.
[b] Closed to fishing.
[c] No data.
[d] Weir counts.
[e] Due to low forecasted and actual returns, the Chenik Special Harvest Area was closed to all fishing for the entire season.

Appendix Table 17. Commercial coho salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	3,054	21	2,915	524	6,514
1975	3,039	7	3,041	124	6,211
1976	1,905	0	1,111	200	3,216
1977	1,255	78	105	360	1,798
1978	4,318	45	1,584	582	6,529
1979	10,846	135	1,116	296	12,393
1980	11,568	16	2,495	426	14,505
1981	7,976	485	1,845	470	10,776
1982	7,165	92	38,685	950	46,892
1983	3,433	54	7,138	594	11,219
1984	3,193	41	13,027	536	16,797
1985	4,258	3,210	2,024	835	10,327
1986	3,095	5,052	9,935	770	18,852
1987	2,163	2,481	8,079	1,631	14,354
1988	2,987	2	4,471	486	7,946
1989	6,667	72	4	5,346	12,089
1990	1,552	74	26	7,645[b]	9,297
1991	9,415	12	2,337	7,283[b]	19,047
1992	1,277	1	1,488	3,136[b]	5,902
1993	4,431	119	3	8,924[b]	13,477
1994	1,373	993	1,897	10,410[b]	14,673
20-Year Avg.	4,680	600	5,071	2,056	12,407
1974-83 Avg.	5,456	93	6,004	453	12,005
1984-93 Avg.	3,904	1,106	4,139	3,659	12,809
'94 % of Ttl.	9.36	6.77	12.93	70.95	100.00

[a] Data source: ADF&G fish ticket database.
[b] Includes commercial seine catches, Seward Silver Salmon Derby entries, and fish taken for hatchery cost recovery purposes.

Appendix Table 18. Commercial pink salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	48,875	1,300	48	378	50,601
1975	893,615	159,908	9,432	383	1,063,338
1976	99,817	93	1,112	35,423	136,445
1977	157,025	1,129,250	6,308	1,349	1,293,932
1978	251,761	70,080	982	29,738	352,561
1979	986,909	1,945,536	58,484	0	2,990,929
1980	478,019	154,041	101,864	155,799	889,703
1981	1,453,982	1,714,115	66,097	44,989	3,279,183
1982	296,556	67,523	43,871	143,639	551,589
1983	690,254	199,794	1,405	36,154	927,607
1984	336,595	89,085	138,145	136,797	700,622
1985	518,889	618,222	194	92,403	1,229,708
1986	542,521	401,755	423,774	40,243	1,408,293
1987	90,522	23,890	72,684	14,333	201,429
1988	852,382	6,094	61,080	1,740	921,296
1989	987,488	52,677	256,669	92	1,296,926
1990	178,087	191,320	2,448	11,815	383,670
1991	253,962	359,664	47,833	167,250	828,709
1992	417,021	146	2,594	60,007	479,768
1993	692,794	159,159	4,205	10,616	866,774
1994	1,589,709	13,200	33	44,987	1,647,929
20-Year Avg.	511,354	367,183	64,961	49,156	992,654
1974-83 Avg.	535,681	544,164	28,960	44,783	1,153,589
1984-93 Avg.	487,026	190,201	100,963	53,530	831,720
'94 % of Ttl.	96.47	0.80	0.00	2.73	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 19. Commercial pink salmon catch in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959 - 1993[a].

Location	1959	1961	1963	1965	1967	1969	1971	1973	1975	1977
Humpy Creek	13.2	34.5	20.6	6.7	6.9	0.6	0	37.3	242.1	26.4
Halibut Cove and Lagoon		33.4	36.9	7.1	33.4	0	11.4	7.2	97.2	16.3
Tutka/Barabara	14.4	106.8	37.7	44.6	31.6	32.9	3.9	20.0	89.2	21.9
Seldovia Bay	4.9	15.1	1.6	19.2	11.7	28.8	27.4	19.4	429.6	47.6
Pt. Graham Bay	5.3	1.0	2.7	12.4	5.1	2.0	1.0	13.9	18.3	44.8
Dogfish Bay	1.6	0	0	0.1	2.3	0	10.4	0.3	0	5.0
Port Chatham	1.2	0	0.8	0	0	0	26.3	20.6	16.0	1.4
Windy Bay	3.1	2.2	0	5.4	0	0	57.3	68.5	18.1	173.2
Rocky Bay	2.3	0	1.4	0.1	0	0	0.1	0.2	0	11.6
Port Dick Bay	28.2	92.9	19.0	15.3	259.9	51.5	94.6	96.6	90.3	881.7
Nuka Bay	33.3	2.0	0.3	0	0.1	0	119.7	8.1	35.4	56.3
Resurrection Bay	8.4	0	0	0	1.2	0	0	0	0	0
Bruin Bay	0	0	12.3	0.9	2.1	0	11.7	0	0	6.2
Rocky/Ursus Coves	3.7	2.7	44.2	0	13.0	52.8	16.4	7.9	0	0
Iniskin and Cottonwood Bays	1.5	3.3	21.8	0	0.1	26.0	0	4.7	0	0.1
Miscellaneous	3.6	9.5	4.3	3.8	8.1	7.8	12.7	2.7	27.1	1.4
Total	124.7	303.4	203.6	115.6	375.5	202.4	392.9	307.4	1,063.3	1,293.9

Location	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Humpy Creek	277.0	239.9	8.1	5.6	0	91.4	0	0.2		
Halibut Cove and Lagoon	27.1	11.1	18.8	5.9	30.5	254.4	91.1	100.2		
China Poot[b]						8.5	135.7	50.6		
Tutka/Barabara	416.8	1,026.6	616.0	491.2	56.5	632.1	117.6	539.4		
Seldovia Bay	140.8	126.4	43.3	3.8	1.2	1.1	0.3	2.4		
Pt. Graham Bay	124.7	45.9	4.1	12.5	2.3	0	0	0		
Dogfish Bay	7.4	22.9	0.2	0	0	0	0	0		
Port Chatham	174.4	55.8	3.3	7.0	0	9.7	7.5	14.7		
Windy Bay	552.7	2.9	0	4.8	0	0	49.1	43.4		
Rocky Bay	122.2	16.5	1.3	0	0	0	0	0		
Port Dick Bay	964.8	1,140.9	140.0	455.6	3.0	0	289.7	26.6		
Nuka Bay	121.7	395.1	55.0	150.8	20.9	43.0	10.6	13.8		
Resurrection Bay	0	32.6	27.1	74.6	11.8	0	0	0.7		
Bruin Bay	40.3	51.9	0.3	0	1.2	202.8	45.1	0.1		
Rocky/Ursus Coves	14.4	14.1	0	0	69.4	53.8	0	0		
Iniskin and Cottonwood Bays	0.2	0	0.3	0	0.2	0	0	0		
Miscellaneous	6.4	16.6	9.8	17.9	4.4	0.1	82.0	74.7		
Total	2,990.9	3,199.2	927.6	1,229.7	201.4	1,296.9	828.7	866.8		

[a] Data source: ADF&G fish ticket database.

[b] China Poot (including Neptune Bay) was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 20. Commercial pink salmon catch in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960 - 1994[a].

Location	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978
Humpy Creek	51.0	73.9	53.5	24.6	2.6	85.2	1.7	33.3	3.3	16.3
Halibut Cove and Lagoon	20.7	35.5	28.9	16.0	41.3	28.9	0.4	.2.	69.8	27.8
Tutka/Barabara	87.6	279.5	100.9	53.5	26.9	43.9	5.2	5.5	18.0	167.9
Seldovia Bay	42.6	142.8	37.4	44.1	23.6	29.0	0.2	3.5	3.0	35.8
Pt. Graham Bay	7.1	18.1	38.4	5.1	23.0	19.6	1.1	4.5	3.9	4.0
Dogfish Bay	1.8	1.4	0.1	7.1	0	9.8	0.3	0	0	0.3
Port Chatham	15.7	102.2	67.1	6.7	10.0	1.9	0	0	0	0
Windy Bay	29.2	85.5	68.6	20.1	3.4	0.8	0	0	0	0
Rocky Bay	17.0	225.9	53.2	0	10.8	36.8	0	0	0	0
Port Dick Bay	257.4	1,118.3	526.3	296.8	55.0	336.5	0	0.6	0	63.6
Nuka Bay	26.6	129.8	23.8	0	90.2	48.4	0.3	0.7	0.1	6.3
Resurrection Bay	5.8	0.1	0.3	0	37.4	40.2	18.2	0	35.4	29.7
Bruin Bay	2.6	0	0	0	126.2	10.2	0	0	0	0
Rocky/Ursus Coves	6.6	3.2	13.5	2.9	18.0	7.5	0	0	0	0.1
Iniskin and Cottonwood Bays	2.1	3.2	4.3	0	9.9	3.5	0	0	0.1	0.1
Miscellaneous	37.8	28.9	39.1	102.3	107.1	14.0	1.3	0.3	2.8	0.7
Total	611.6	2,248.3	1,055.4	579.2	585.4	716.2	28.7	50.6	136.4	352.6

Location	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998
Humpy Creek	48.6	4.9	53.5	116.7	0	0	0	0		
Halibut Cove and Lagoon	4.7	1.0	10.9	14.0	106.8	91.0	58.4	105.6		
China Poot[b]					5.4	46.1	35.7	24.2		
Tutka/Barabara	312.5	184.9	262.0	400.2	723.9	37.4	320.9	1,454.5		
Seldovia Bay	81.7	70.3	2.2	2.8	5.5	3.6	1.9	5.4		
Pt. Graham Bay	30.5	35.4	8.0	8.8	10.7	0	0	0		
Dogfish Bay	4.7	1.7	0.1	0	0	0	0	0		
Port Chatham	1.8	12.6	0	0	0	22.1	0	0		
Windy Bay	0	0	0	0	0	0	0	0		
Rocky Bay	1.4	0	0	0	0	0	0	0		
Port Dick Bay	133.3	44.0	84.6	304.0	5.9	169.1	0.1	1.6		
Nuka Bay	12.8	8.7	4.4	97.8	0.2	0.2	0	11.6		
Resurrection Bay	155.8	137.4	122.3	36.5	0.5	0	0	T		
Bruin Bay	100.6	13.3	125.2	349.7	5.0	0.4	1.9	T		
Rocky/Ursus Coves	0	20.2	8.5	71.1	49.9	0	0.3	0		
Iniskin and Cottonwood Bays	0.1	0.4	0.4	0.2	1.3	0	T	0		
Miscellaneous	0.2	16.8	18.5	6.5	6.2	60.6	60.6	45.0		
Total	889.7	551.6	700.6	1,408.3	921.3	383.7	479.8	1,647.9		

[a] Data source: ADF&G fish ticket database.

[b] China Poot (including Neptune Bay) was part of Halibut Cove Subdistrict prior to 1988.

Appendix Table 21. Commercial chum salmon catch in numbers of fish by district, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern	Outer	Kamishak	Eastern	Total
1974	2,752	11,924	4,554	7	19,210
1975	5,428	11,348	4,868	2	21,646
1976	1,517	412	48,848	45	50,822
1977	6,734	70,167	65,659	3,229	145,789
1978	5,525	19,224	48,669	100	73,518
1979	8,221	180,558	29,711	0	218,490
1980	4,605	32,246	35,921	720	73,492
1981	20,920	238,393	73,501	3,279	336,093
1982	18,466	631,075	108,946	7,698	198,185
1983	14,281	27,203	142,901	7,934	192,319
1984	8,065	3,204	70,736	10,535	92,540
1985	5,513	11,844	8,139	5,144	30,640
1986	5,560	11,701	61,670	3,757	82,688
1987	5,030	28,663	108,412	14,913	157,018
1988	7,742	71,202	218,299	24,668	321,911
1989	3,141	43	7,809	312	11,305
1990	2,433	614	3,597	307	6,951
1991	1,962	14,337	7,853	80	24,232
1992	1,885	181	20,051	86	22,203
1993	2,788	970	600	9	4,367
1994	2,631	32	14	2,792	5,469
20-Year Avg.	6,627	39,865	53,537	4,141	104,171
1974-83 Avg.	8,842	65,455	56,358	2,301	132,956
1984-93 Avg.	4,412	14,276	50,717	5,981	75,386
'94 % of Ttl.	48.11	0.59	0.26	51.05	100.00

[a] Data source: ADF&G fish ticket database.

Appendix Table 22. Commercial chum salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 - 1994[a].

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Tutka	0.1	2.4	1.8	2.9	2.4	5.6	1.1	3.9	4.0	1.3	0.7	1.6
Port Graham	2.3	1.8	0.5	4.0	3.8	2.1	0.9	5.3	3.0	2.3	1.3	4.8
Dogfish	4.9	0.4	0.1	0	0.2	0	0	7.0	15.3	0.1	0	50.9
Port Chatham	1.0	2.5	0	2.8	4.3	5.2	0	17.8	0	1.0	0	0.1
Rocky/Windy	14.9	6.4	2.2	8.5	0.3	33.8	8.1	1.7	0	0.5	0	39.4
Port Dick	42.4	51.0	36.8	112.0	110.8	227.4	14.2	60.9	36.0	10.9	5.4	41.2
Nuka	1.7	8.4	1.7	0.5	1.5	0	0	0	1.5	6.9	0	5.9
Resurrection	0.1	0.5	0	0	0	0	0	0	0.1	0.7	0	0.6
Douglas River	0.2	0	0	0	0	0	0	0	0	0	0	0
Kamishak River	0	0	0	0	0	0	0	0	0	3.7	0.4	0
McNeil River	0	0.4	0	0	0	2.7	0.9	0	0.4	8.3	4.4	1.9
Bruin Bay	0	0.3	0.5	0	0.1	0	0.4	0	1.0	7.5	0	12.8
Ursus/Rocky Coves	8.5	8.6	1.8	1.1	2.8	1.2	0	4.0	2.9	1.0	3.6	8.9
Cottonwood/Iniskin	12.1	33.4	10.2	41.7	10.9	10.9	0	0	19.0	25.5	44.4	71.9
Miscellaneous	22.6	0	0	5.8	1.4	1.4	2.5	28.5	2.2	5.4	1.0	2.4
Total	110.8	116.1	55.6	179.3	138.5	323.3	28.1	129.1	85.4	75.1	61.2	242.4

Location	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Tutka	0.5	1.3	0.8	1.4	2.0	0.9	0.8	2.6	2.7	1.8	7.9	8.3
Port Graham	2.0	3.2	2.6	1.0	2.2	0.5	5.0	2.4	4.3	2.5	11.2	7.4
Dogfish	114.5	41.1	0.4	0	0	0	9.4	0	8.5	2.1	71.8	15.6
Port Chatham	2.4	0	0.4	0	0.6	0	0.1	0	1.7	1.3	59.6	16.2
Rocky/Windy	1.4	0	0.9	0	0.3	0	17.7	0	76.7	2.1	7.4	0
Port Dick	0.7	0	33.4	8.1	6.8	0	25.6	10.3	79.0	19.0	95.8	30.3
Nuka	0.1	2.3	40.8	3.9	3.6	0.4	17.4	0.4	14.7	7.8	3.8	0.9
Resurrection	0.4	0.7	0	0	0	0	0	0.1	0	0.7	2.4	7.7
Douglas River	0	0	0	0	0.1	7.1	4.0	2.9	0.7	10.0	46.7	37.1
Kamishak River	0	2.4	0	1.8	0	10.5	0	23.9	17.8	2.8	8.6	9.2
McNeil River	0	2.3	0	2.0	0	16.9	38.5	4.9	6.5	6.3	11.6	32.6
Bruin Bay	1.6	1.8	0	0.7	0	0	0	0	4.0	11.0	1.7	1.3
Ursus/Rocky Coves	10.3	0.2	5.7	0	2.0	2.8	7.8	1.9	0.5	0.3	1.5	13.5
Cottonwood/Iniskin	14.5	19.7	29.9	0	2.8	11.5	15.3	14.9	0.2	5.4	3.5	21.6
Miscellaneous	0.2	0.5	0.6	0.3	1.2	0.2	4.2	9.2	1.2	0.4	2.6	3.5
Total	148.6	75.5	115.5	19.2	21.6	50.8	145.8	73.5	218.5	73.5	336.1	198.0

Location	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Tutka	9.9	3.4	3.2	3.9	3.9	4.7	2.5	1.5	0.8	0.6	0.9	0.8
Port Graham	1.7	3.6	1.3	0.8	0.4	1.2	0	0	0	0	0	0
Dogfish	2.8	1.1	0	0	0	0	0	0	0	0	0	0
Port Chatham	2.1	0	1.3	0	0	0	0	0.1	0.1	0	0.1	0
Rocky/Windy	3.2	0	0	0	0	0	0	0	0.5	0	0.1	0
Port Dick	18.0	1.9	9.6	10.4	27.1	64.4	0	0.5	13.7	0.2	0.7	T
Nuka	0.8	0.2	0.8	1.3	1.6	6.8	0	T	T	0	T	T
Resurrection	6.9	3.0	3.0	3.5	13.9	23.9	0	0	0	0	0	2.5
Douglas River	27.2	9.2	8.0	11.6	23.7	24.8	0	0.1	3.0	12.5	T	T
Kamishak River	23.9	16.2	0.1	0.1	24.6	26.7	0	T	0.7	1.5	0	0
McNeil River	67.9	12.0	0	13.7	32.9	104.0	0.1	0.1	0.1	2.0	0.4	0
Bruin Bay	2.6	5.9	0	5.4	0.1	2.8	4.4	0.1	2.6	0.8	T	0
Ursus/Rocky Coves	0	3.7	0	22.1	17.2	20.7	3.4	0	0	2.7	0	0
Cottonwood/Iniskin	21.4	23.0	0	8.8	9.7	39.2	0	0	1.0	0.2	0	0
Miscellaneous	3.9	9.3	3.3	1.1	1.9	2.7	0.9	4.7	1.7	1.6	2.1	2.1
Total	192.3	92.5	30.6	82.7	157.0	321.9	11.3	7.0	24.2	22.2	4.4	5.5

[a] Data source: ADF&G fish ticket database.

Appendix Table 23. Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1974 - 1994[a].

Year	English Bay	Ander. Beach	Delight Lake	Desire Lake	Bear Lake[b]	Aialik Lake	Mikfik Lake	Chenik Lake	Amakde. Creek	Kamish. River	Douglas River	Douglas Beach	Total
1974	-	-	-	-	0.1	2.2	0.9	0.1	0.4	-	-	-	3.7
1975	2.5	-	2.0	6.5	0	8.0	6.0	0.1	0.8	-	-	-	25.9
1976	6.0	-	6.0	11.0	0.6	8.0	10.0	0.9	1.6	-	0.2	0.1	44.4
1977	12.5	-	5.2	10.7	0	5.0	9.8	0.2	2.6	-	2.6	0.4	49.0
1978	13.5	0.6	8.0	10.0	0	3.0	12.0	0.1	2.6	1.0	-	0.1	50.9
1979	4.4	-	8.0	12.0	0	5.0	6.0	0	1.0	0.4	-	0.3	37.1
1780	12.0	0.3	10.0	17.0	1.5	6.6	6.5	3.5	2.6	0.1	0.4	0.5	61.0
1981	10.5	-	7.3	12.0	0.7	1.8	5.3	2.5	1.9	0.8	0.2	0.3	43.3
1982	20.0	0.6	25.0	18.0	0.5	22.4	35.0	8.0	3.2	10.0	4.2	1.6	148.5
1983	12.0	0.5	7.0	12.0	0.7	20.0	7.0	11.0	1.2	5.0	0.5	0.4	77.3
1984	11.1	1.2	10.5	15.0	0.5	22.0	6.0	13.0	1.4	2.5	0	0.1	83.3
1985	5.0	0.1	26.0	18.0	1.1	8.0	20.0	3.5	0.9	0.8	0	0	83.4
1986	2.8	0.9	13.0	10.0	0.8	7.6	7.8	7.0	1.9	5.0	0.2	0.2	57.2
1987	7.0	0.2	10.5	13.4	0.3	9.2	9.0	10.0	1.1	-	0.1	-	60.8
1988	2.5	0.3	1.2	9.0	0.1	13.0	10.1	9.0	0.4	0.5	0	0.1	46.2
1989	4.5	-	7.7	9.0	0.1	6.5	11.5	12.0	1.2	0.5	0.6	0.2	53.8
1990	3.3	-	5.2	9.5	1.1	5.7	8.8	17.0	1.8	0.2	0.6	-	53.2
1991	7.0	-	4.1	8.2	0.7	3.7	9.7	10.2	1.9	0.7	-	0.1	46.3
1992	6.4	-	5.9	11.9	1.9	2.5	7.8	9.3	1.9	4.9	0.2	-	52.7
1993	8.9	-	5.0	11.0	5.0	3.0	6.4	4.0	2.0	4.1	-	-	47.2
1994	13.8	-	5.6	10.5	8.6	7.3	9.5	0.8	0.8	[c]	-	-	56.9
20-Year Average	7.8	0.5	8.7	11.5	0.5	8.1	9.6	5.9	1.6	2.3	0.7	0.3	57.5
1974-83 Average	9.5	0.5	8.2	11.4	0.4	6.4	9.4	1.6	1.9	2.5	1.5	0.5	53.8
1984-93 Average	6.2	0.5	9.1	11.6	0.7	9.8	9.8	10.2	1.4	2.2	0.2	0.2	61.9
Es.Goal	10-20	1	10	10	5-8	2.5-5	5-7	10	1	*	*	*	51-66

[a] Estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

[b] Limited by Bear Lake Management Plan since 1971.

[c] Insufficient survey data to generate escapement information.

Appendix Table 24. Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960 - 1994[a].

					Y	E	A	R			
Location	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Humpy Creek	10.0	22.6	56.0	34.7	18.5	28.0	30.0	25.0	24.7	5.4	55.2
China Poot Creek	9.0	2.0	26.0	-	-	-	-	2.5	6.0	0.2	1.5
Tutka Lagoon Creek	15.0	15.0	30.0	10.0	20.0	20.0	12.0	7.0	7.9	6.5	6.5
Barabara Creek	2.0	0.1	1.5	0.1	-	-	5.0	-	2.0	0.9	0.4
Seldovia River	25.0	25.0	50.0	13.0	60.0	30.0	86.0	55.0	53.2	60.0	23.0
Port Graham River	15.0	5.0	50.0	2.0	16.0	1.5	24.0	2.0	24.4	4.0	16.6
Dogfish Lagoon	2.0	-	3.0	-	-	-	-	-	-	-	-
Port Chatham Creeks	4.0	7.0	7.0	-	-	-	10.0	-	-	-	3.0
Windy Right Creek	8.0	10.0	12.5	4.9	6.2	2.0	7.0	6.0	2.8	3.2	2.1
Windy Left Creek	8.0	5.0	12.5	4.5	7.7	10.0	7.0	6.0	6.9	23.0	13.0
Rocky River	130.0	2.0	200.0	12.0	80.0	0.3	44.0	1.0	43.1	1.0	32.0
Port Dick Creek	35.0	14.0	40.0	16.0	31.5	50.0	35.0	20.0	29.0	12.0	34.5
Island Creek	23.2	2.0	15.0	3.6	30.0	0.5	7.0	0.5	4.3	0.1	5.5
South Nuka Island Creek	20.0	2.0	22.0	0.1	10.0	-	10.0	-	10.0	3.0	11.0
Desire Lake Creek	-	-	18.0	-	1.3	-	-	-	-	-	-
James Lagoon	-	-	-	-	-	-	-	-	-	-	-
Alalik Lagoon	-	-	25.0	0.3	-	-	2.0	-	-	-	-
Bear Creek	1.4	-	3.1	-	6.4	-	-	-	3.1	-	-
Salmon Creek	-	-	-	-	-	-	-	-	-	-	-
Thumb Cove	-	-	-	-	-	-	-	-	-	-	-
Humpy Cove	-	-	-	-	-	-	-	-	-	-	-
Tonsina Creek	-	-	-	-	-	-	-	-	2.9	0.1	-
Big Kamishak River	-	-	100.0	75.0	75.0	-	13.0	-	-	-	-
Little Kamishak River	-	-	100.0	24.0	-	-	28.0	3.5	-	0.5	2.0
Amakdedori Creek	60.0	-	80.0	-	10.0	-	8.0	-	-	1.0	13.0
Bruin Bay River	18.0	-	300.0	25.0	-	-	20.0	0.5	-	5.0	40.0
Sunday Creek	1.5	-	5.0	2.0	-	-	20.0	-	-	1.0	2.0
Brown's Peak Creek	-	-	25.0	10.0	20.0	10.0	11.0	-	-	2.0	-
Totals	387.1	111.7	1,181.6	237.2	392.6	152.3	379.0	129.0	220.3	128.9	261.3

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Appendix Table 24. (page 2 of 4)

Location	Y E A R										
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Humpy Creek	45.0	13.8	36.9	17.4	64.0	27.2	86.0	46.1	200.0	64.4	115.0
China Poot Creek	2.1	1.0	6.0	5.2	21.6	2.0	3.9	11.2	20.6	12.3	5.0
Tutka Lagoon Creek	16.7	1.5	6.5	2.6	17.6	11.5	14.0	15.0	10.6	17.3	21.1
Barabara Creek	4.0	0.6	-	0.2	22.7	0.2	5.7	1.4	10.0	5.8	16.8
Seldovia River	31.1	5.8	14.5	13.7	36.2	25.6	35.7	24.6	43.7	65.5	62.7
Port Graham River	13.2	2.4	7.0	2.8	27.3	6.5	20.6	6.7	32.7	40.2	18.4
Dogfish Lagoon	0.3	-	1.0	-	2.3	-	8.1	0.6	7.3	0.3	2.6
Port Chatham Creeks	15.5	1.0	5.0	0.2	7.7	-	14.2	0.3	20.8	7.7	11.2
Windy Right Creek	13.0	0.1	4.6	0.1	18.7	0.2	11.1	0.3	10.4	3.3	4.7
Windy Left Creek	35.4	0.4	12.9	0.1	9.7	0.2	47.3	1.1	74.8	10.9	31.3
Rocky River	1.6	8.2	2.0	1.5	4.4	2.7	36.7	8.2	85.0	6.4	25.0
Port Dick Creek	97.8	10.0	26.4	1.5	62.8	12.7	109.3	44.9	116.0	56.1	106.0
Island Creek	0.1	1.7	0.5	0.5	0.1	-	0.6	0.4	0.6	2.2	25.0
South Nuka Island Creek	14.0	0.3	16.0	-	28.0	-	12.0	-	15.0	0.3	16.0
Desire Lake Creek	30.0	0.3	3.0	-	0.4	0.6	0.8	1.0	3.0	16.0	5.0
James Lagoon	-	-	-	-	-	-	-	-	-	4.6	14.0
Aialik Lagoon	-	-	-	0.1	-	0.4	-	-	-	-	-
Bear Creek	-	0.5	-	4.9	-	10.0	-	7.8	-	13.3	0.4
Salmon Creek	-	-	-	-	-	16.9	-	11.0	-	15.5	0.1
Thumb Cove	-	-	-	1.1	-	2.0	-	2.0	-	1.2	1.0
Humpy Cove	-	-	-	0.6	-	1.4	-	0.9	-	5.7	0.4
Tonsina Creek	-	-	-	1.4	-	5.7	-	1.5	-	0.7	0.2
Big Kamishak River	-	-	15.0	1.0	-	8.0	-	12.0	10.0	2.0	-
Little Kamishak River	-	-	13.0	-	-	6.0	-	0.4	3.5	0.6	-
Amakdedori Creek	-	0.2	3.0	1.0	5.0	-	-	0.9	6.0	3.8	1.5
Bruin Bay River	22.0	2.5	2.0	0.6	20.0	13.5	60.0	33.0	200.0	400.0	95.0
Sunday Creek	43.0	2.0	5.0	0.1	20.0	0.3	9.0	0.2	12.0	5.2	14.2
Brown's Peak Creek	8.0	1.2	3.2	0.1	10.0	1.2	13.0	0.9	15.0	2.3	17.7
Totals	392.8	53.5	183.5	56.7	378.5	154.8	488.0	232.4	897.0	763.6	610.3

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Appendix Table 24. (page 3 of 4)

Location	Y E A R									
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Humpy Creek	31.9	104.0	84.2	117.0	49.7	26.6	21.4	93.0	27.0	17.4
China Poot Creek	3.1	14.1	8.4	1.9	11.5	3.1	3.9	8.5	4.2	2.6
Tutka Lagoon Creek	18.5	12.9	10.5	14.0	13.4	4.8	11.2	11.9	38.5	16.8
Barabara Creek	2.1	14.8	1.0	1.6	1.8	0.3	0.7	4.5	3.9	10.9
Seldovia River	38.4	27.9	14.2	22.8	28.2	7.6	16.9	26.2	27.8	30.0
Port Graham River	28.9	4.6	10.9	26.3	17.5	3.8	7.9	19.1	20.1	29.0
Dogfish Lagoon	2.6	1.0	0.6	0.2	0.4	1.2	0.3	0.2	7.1	9.3
Port Chatham Creeks	2.0	3.5	7.8	8.9	11.5	10.2	21.0	31.7	27.8	23.8
Windy Right Creek	4.7	4.3	3.4	5.4	2.5	2.0	1.3	6.6	7.1	20.7
Windy Left Creek	4.4	11.9	2.5	8.9	2.2	5.6	3.4	25.2	7.5	34.5
Rocky River	6.6	16.6	9.0	12.1	12.0	4.5	5.4	10.3	18.0	26.1
Port Dick Creek	19.9	64.1	44.6	65.3	41.6	4.5	12.0	55.4	41.7	54.2
Island Creek	15.0	15.3	35.0	27.9	16.6	0.1	7.2	6.7	25.0	24.4
South Nuka Island Creek	0.4	22.2	0.6	3.6	7.0	2.8	1.2	7.3	13.3	16.4
Desire Lake Creek	12.0	8.5	23.0	62.5	32.0	11.0	2.5	47.0	1.0	1.3
James Lagoon	6.0	5.1	4.0	9.0	6.6	1.1	1.7	4.9	3.8	4.4
Aialik Lagoon	5.0	3.0	4.0	9.4	6.0	1.5	0.7	0.8	-	-
Bear Creek	7.9	0.8	7.7	4.1	14.0	3.5	0.2	1.7	4.4	15.4[b]
Salmon Creek	21.0	0.5	10.2	2.1	8.3	1.7	0.1	1.6	-	[b]
Thumb Cove	7.9	4.9	4.2	14.5	4.0	2.7	0.3	4.2	-	3.4
Humpy Cove	4.0	2.0	2.5	5.0	0.9	0.3	0.4	1.0	3.8	-
Tonsina Creek	7.5	5.4	6.0	48.2	11.2	3.4	0.1	0.5	1.2	0.3
Big Kamishak River	5.0	-	-	-	5.0	-	1.0	-	-	-
Little Kamishak River	2.2	-	0.1	1.6	2.0	-	0.5	-	-	0.9
Amakdedori Creek	6.3	0.2	-	1.0	6.0	0.4	1.0	2.0	0.1	0.7
Bruin Bay River	75.0	4.0	110.0	3.5	1,200.0	24.0	29.0	350.0	19.0	74.9
Sunday Creek	12.0	4.7	12.0	11.4	109.0	29.7	18.0	103.0	2.8	20.9
Brown's Peak Creek	3.5	1.7	6.8	7.0	28.0	40.2	17.0	120.0	1.0	16.7
Totals	353.8	358.0	423.2	495.2	1,648.9	196.6	186.3	943.3	306.1	455.0

-continued-

Appendix Table 24. (page 4 of 4)

Location	Y E A R 1992	1993	1994	1995	1996	1997	1998	1960-93 Average	Goal
Humpy Creek	14.9	36.0	14.1					48.5	25-50
China Poot Creek	4.1	1.6	5.7					6.8	5
Tutka Lagoon Creek	26.7	27.4	14.5					14.4	6-10
Barabara Creek	2.2	11.9	4.5					4.5	18-24
Seldovia River	14.7	43.4	24.4					33.5	25-35
Port Graham River	5.4	12.8	7.6					15.4	20-40
Dogfish Lagoon	[c]	0.3	1.3					2.4	-
Port Chatham Creeks	4.3	22.2	3.3					10.7	10-15
Windy Right Creek	3.9	13.6	2.2					6.1	10
Windy Left Creek	8.2	25.9	3.0					13.8	30-50
Rocky River	25.4	70.0	17.1					27.7	50
Port Dick Creek	6.9	37.0	18.1					41.4	20-100
Island Creek	12.6	12.1	28.3					9.7	12-18
South Nuka Island Creek	6.1	34.3	1.4					10.5	10
Desire Lake Creek	0.4	19.3	-					12.5	10-20
James Lagoon	0.4	3.3	0.8					4.9	5-10
Aialik Lagoon	[d]	-	-					4.5	5
Bear Creek	2.3	6.6[b]	34.8[b]					5.4	5
Salmon Creek	5.3	[b]	[b]					7.3	10
Thumb Cove	0.4	5.5	10.8					3.7	4
Humpy Cove	[c]	0.9	2.2					2.0	2
Tonsina Creek	[c]	3.2	7.0					5.5	5
Big Kamishak River	[c]	-	-					24.8	20
Little Kamishak River	[c]	-	-					11.1	20
Amakdedori Creek	3.2	1.7	0.7					8.6	5
Bruin Bay River	3.2	86.4	5.9					107.9	25-50
Sunday Creek	2.9	57.8	3.1					18.2	10
Brown's Peak Creek	5.0	41.6	1.3					15.1	10
Totals	158.4	574.8	212.1					496.2	377-593

[a] Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

[b] Escapement figure for Bear Creek actually represents the combined escapement for Bear and Salmon Creeks.

[c] Insufficient survey data for escapement estimates.

Appendix Table 25. Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1974 - 1994[a].

Year	Port Grhm.	Dogfish Lagoon	Rocky River	Pt.Dk Head	Isl. Creek	Big Kam.	Little Kam.	McNeil River	Bruin Bay	Ursus Cove	Cotton. Creek	Inisk. Bay	Total
1974	0.5	0.6	1.0	0.8	5.0	7.1	0.6	1.5	3.0	3.5	2.5	7.0	33.1
1975	3.0	5.0	25.0	4.0	7.4	1.1	1.9	1.5	1.5	5.0	8.0	7.0	70.4
1976	0.4	3.0	12.0	1.5	1.0	24.0	21.0	10.0	4.0	6.0	5.0	13.5	101.4
1977	5.2	6.4	10.5	5.0	11.1	-	-	20.0	18.0	9.3	10.0	4.4	99.9
1978	4.8	9.3	6.3	8.9	16.9	23.0	30.0	45.0	4.0	9.7	12.5	11.4	181.8
1979	2.2	8.2	35.0	4.0	16.8	15.0	15.0	8.0	15.0	5.0	2.5	4.0	130.7
1980	1.1	4.0	23.0	4.2	10.9	10.0	13.0	8.0	15.0	8.0	4.2	9.3	110.7
1981	4.8	11.5	12.5	4.1	17.5	11.0	6.0	30.0	10.0	10.0	9.0	9.0	135.4
1982	2.5	8.5	2.8	1.7	8.7	25.0	18.0	25.0	10.0	9.0	7.0	12.8	131.0
1983	1.9	5.3	4.0	4.5	36.2	25.0	25.0	48.0	5.5	7.7	8.3	12.0	183.4
1984	2.1	8.6	3.5	2.7	25.6	19.0	12.0	21.0	8.0	7.0	6.5	9.8	125.8
1985	0.5	4.9	2.5	1.0	9.1	6.0	4.5	9.5	2.0	3.0	3.0	5.0	51.0
1986	0.6	2.5	2.0	1.7	8.6	24.0	17.0	22.0	2.0	11.0	11.0	5.9	108.3
1987	1.5	2.0	0.2	6.1	13.2	12.0	18.0	26.0	10.0	9.9	17.0	9.1	125.0
1988	3.5	8.6	0.3	9.0	7.8	15.0	13.0	49.0	7.0	9.4	16.0	9.5	148.1
1989	1.3	1.8	1.2	3.3	4.8	30.0	12.0	34.0	8.0	6.3	8.0	5.9	116.6
1990	2.6	1.0	0.8	1.1	2.3	2.5	7.9	8.0	4.0	3.8	4.3	8.4	46.7
1991	1.1	3.1	-	7.4	17.3	8.7	8.4	10.0	6.0	1.3	7.7	8.3	79.3
1992	1.4	0.8	1.7	5.4	6.7	4.5	7.1	19.2	8.5	1.7	6.1	3.4	65.0
1993	2.5	5.4	0.1	2.5	3.6	9.1	6.3	15.6	6.0	7.7	12.0	8.0	78.8
1994	5.2	11.3	1.9	3.5	8.8	-	9.0	15.0	6.1	6.2	10.2	18.9	96.1
20-Year Average	2.2	5.0	7.6	3.9	11.5	14.3	12.5	20.6	7.4	6.7	8.0	8.2	106.2
1974-83 Average	2.6	6.2	13.2	3.9	13.2	15.7	14.5	19.7	8.6	7.3	6.9	9.0	117.8
1984-93 Average	1.7	3.9	1.4	4.0	9.9	13.1	10.6	21.4	6.2	6.1	9.2	7.3	94.6
Es.Goal	4-8	5-10	20	4	10-15	20	20	20-40	5-10	5-10	10	10	133-177

[a] Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

Appendix Table 26. Personal use/subsistence set gillnet salmon catch in numbers of fish by species, Southern District, Lower Cook Inlet, 1969 - 1994[a].

Year	Total Permits Issued	Permits Returned Number	Permits Returned %	Permits Actually Fished	Permits Not Fished	Chinook	Sockeye	Coho	Pink	Chum	Other	Total
1969	47	44	93.6	35	9	0	9	752	38	0	17	816
1970	78	73	93.6	55	18	0	12	1,179	143	13	39	1,386
1971	112	95	84.8	53	42	2	16	1,549	44	7	20	1,638
1972	135	105	77.8	64	41	1	11	975	48	69	19	1,123
1973	143	128	89.5	82	46	0	18	1,304	84	40	9	1,455
1974	148	118	79.7	52	66	0	16	376	43	77	27	539
1975	292	276	94.5	221	55	4	47	1,960	632	61	95	2,799
1976	242	221	91.3	138	83	16	46	1,962	1,513	56	75	3,668
1977	197	179	90.9	137	42	12	46	2,216	639	119	84	3,116
1978	311	264	84.9	151	113	4	35	2,482	595	34	89	3,239
1979	437	401	91.8	238	163	6	37	2,118	2,251	41	130	4,583
1980	533	494	92.7	299	195	43	32	3,491	1,021	25	153[b]	4,765
1981	384	374	97.4	274	100	25	64	4,314	732	89	100	5,324
1982	395	378	95.7	307	71	39	46	7,303	955	123	8	8,474
1983	360	328	91.1	210	118	4	21	2,525	330	40	2	2,922
1984	390	346	88.7	219	127	4	25	3,666	821	87	25	4,628
1985	316	302	95.6	205	97	5	43	3,372	166	35	3	3,624
1986	338	310	91.7	247	63	7	68	3,831	3,132	56	0	7,094
1987	361	338	93.6	249	89	5	50	3,977	279	61	0	4,372
1988	438	404	92.2	287	117	14	60	4,877	1,422	75	0	6,448
1989	466	452	97.0	332	120	41	156	7,215	882	53	49	8,396
1990	578	543	93.9	420	123	12	200	8,323	1,846	69	0	10,450
1991	472	459	97.2	295	164	8	47	4,931	366	23	0	5,375
1992	365	350	95.9	239	111	5	63	2,277	643	21	0	3,009
1993	326	317	97.2	215	102	6	44	1,992	463	18	0	2,523
1994	286	284	99.3	224	60	66	80	4,097	1,178	18	0	5,439
1969-93 Average	315	292	92.8	201	91	11	48	3,159	764	52	38	4,071

[a] Figures after 1991 include information from both returned permits and inseason oral reports.
[b] Steelhead trout (*Oncorhyncus mykiss*).

Appendix Table 27. Summary of personal use/subsistence salmon gillnet fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery) by area of residence, 1974 - 1994.

	Homer/ Fritz Creek		Anchorage Area[a]		Halibut Cove		Anchor Pt./ Ninilchik		Seldovia		Pt. Graham/ Nanwalek		Kenai/ Soldotna		Other		Total Permits
Year	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Issued
1974	108	73.0	20	13.5	6	4.1	4	2.7	1	0.7	3	2.0	5	3.4	1	0.7	148
1975	118	75.2	13	8.3	6	3.8	7	4.5	5	3.2	2	1.3	4	2.5	2	1.3	157
1976	182	70.0	24	9.2	9	3.5	25	9.6	5	1.9	4	1.5	6	2.3	5	1.9	260
1977	153	77.3	8	4.0	8	4.0	17	8.6	7	3.5	0	0.0	2	1.0	3	1.5	198
1978	214	68.8	40	12.9	5	1.6	30	9.6	12	3.9	3	1.0	4	1.3	3	1.0	311
1979	276	62.7	67	15.2	2	0.5	61	13.9	3	0.7	0	0.0	11	2.5	20	4.6	440
1980	310	57.9	81	15.1	0	0.0	80	15.0	7	1.3	0	0.0	42	7.9	13	2.4	535
1981	274	71.4	43	11.2	8	2.1	37	9.6	3	0.8	1	0.3	14	3.6	4	1.0	384
1982	295	74.7	19	4.8	9	2.3	44	11.1	0	0.0	0	0.0	7	1.8	21	5.3	395
1983	267	77.8	24	7.0	3	0.9	33	9.6	8	2.3	0	0.0	0	0.0	8	2.3	343
1984	266	72.1	20	5.4	6	1.6	62	16.8	5	1.4	1	0.3	5	1.4	4	1.1	369
1985	251	79.4	15	4.7	6	1.9	33	10.4	6	1.9	0	0.0	2	0.6	3	0.9	316
1986	280	82.8	18	5.3	4	1.2	29	8.6	1	0.3	0	0.0	1	0.3	5	1.5	338
1987	284	78.7	25	6.9	3	0.8	37	10.2	7	1.9	0	0.0	2	0.6	3	0.8	361
1988	338	77.2	36	8.2	5	1.1	43	9.8	6	1.4	0	0.0	10	2.3	0	0.0	438
1989	348	74.7	36	7.7	5	1.1	51	10.9	8	1.7	0	0.0	6	1.3	12	2.6	466
1990	441	76.3	36	6.2	5	0.9	65	11.2	12	2.1	0	0.0	6	1.0	13	2.2	578
1991	384	81.4	27	5.7	8	1.7	41	8.7	6	1.3	0	0.0	4	0.8	2	0.4	472
1992	302	82.7	21	5.8	5	1.4	32	8.8	3	0.8	0	0.0	1	0.3	1	0.3	365
1993	242	74.2	25	7.7	5	1.5	44	13.5	3	0.9	0	0.0	5	1.5	2	0.6	326
1994	235	82.2	20	7.0	4	1.4	21	7.3	1	0.3	0	0.0	1	0.3	4	1.4	286
'74-'93 Avg.	265	74.4	29	8.3	5	1.5	38	10.6	5	1.5	1	0.2	7	1.8	6	1.7	356

[a] After 1989, "Anchorage Area" includes Eagle River, Chugiak, Mat-Su Valley, and/or Fort Richardson.

Appendix Table 28. Subsistence salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1981 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	House-holds
1981[b]	116	1,694	625	298	150	2,883	47
1982[b]	98	798	508	851	193	2,448	38
1983[c]	57	1,066	440	169	65	1,797	31
1984[c]	21	2,095	166	215	6	2,503	34
1985[c]	156	469	190	42	22	879	[d]
1986[b]	118	279	179	234	13	823	36
1987[e]	21	186	574	264	69	1,114	31
1988[f]	90	380	447	577	88	1,582	31
1989	48	94	555	524	46	1,267	32
1990	180	472	811	1,107	68	2,638	31
1991	178	61	355	1,454	173	2,221	32
1992[b]	127	100	449	707	167	1,550	37
1993[b]	248	153	396	978	130	1,905	27
1994[b]	267	246	872	858	452	2,695	43
1981-93 Average	112	604	438	571	92	1,817	34

[a] Data source: ADF&G, Subsistence Division, data files.
[b] Data include both subsistence set gillnet and rod/reel harvest.
[c] Data include only subsistence set gillnet harvest.
[d] No data.
[e] 46% set gillnet harvest, 54% rod/reel.
[f] 51% set gillnet harvest, 49% rod/reel.

Appendix Table 29. Subsistence salmon catch in numbers of fish by species for the village of Nanwalek (formerly English Bay), Lower Cook Inlet, 1981 - 1994[a].

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	House-holds
1981[b]	24	1,075	314	621	19	2,053	29
1982[b]	13	1,584	1,305	1,850	36	4,788	31
1983[c]	0	1,784	367	363	10	2,524	28
1984[c]	18	1,225	385	404	0	2,032	26
1985[c]	5	696	530	313	2	1,546	[d]
1986[b]	4	378	296	825	2	1,505	21
1987[e]	2	626	322	476	45	1,471	21
1988[f]	8	609	385	1,185	35	2,222	26
1989	0	60	651	868	0	1,579	29
1990	46	636	616	1,968	49	3,305	30
1991	4	574	1,508	3,087	46	5,219	35
1992[b]	72	430	570	519	59	1,650	40
1993[b]	24	1,018	570	1,703	115	3,430	21
1994[b]	29	642	512	1,127	49	2,359	25
1981-93 Average	17	823	601	1,091	32	2,564	28

[a] Data source: ADF&G, Subsistence Division, data files.
[b] Data include both subsistence set gillnet and rod/reel harvest.
[c] Data include only subsistence set gillnet harvest.
[d] No data.
[e] 63% set gillnet harvest, 37% rod/reel.
[f] 37% set gillnet harvest, 63% rod/reel.

Appendix Table 30. FRED Division and/or CIAA salmon stocking projects and releases of salmon fry, fingerling, and smolt, in millions of fish, Lower Cook Inlet, 1984 - 1994.

Lake, River, or Bay	Species	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Leisure Lake	Sockeye	2.110	2.018	2.350	2.022	2.100	2.000	1.750	2.000	2.000	2.000	0	
Chenik Lake	Sockeye	-	-	0.839	1.000	2.600	3.500	3.250	2.200	2.750	1.400	0	
Paint River Lakes:													
Upper	Sockeye			0.500	-	1.100	1.000	1.000	0.500	0.500	0.500	0	
Lower	Sockeye			0.320	-	0.552	0.500	0.500	0.250	0.250	0.250	0	
Elusivak	Sockeye					0.521	0.500	0.500	0	0	0	0	
Kirschner Lake	Sockeye				0.867	0.521	0.250	0.250	0.250	0.250	0.250	0.300	
Bruin Lake	Sockeye							0.500	0.250	0.250	0.250	0	
Ursus Lake	Sockeye									0.250	0.250	0	
Port Dick Lake	Sockeye				0.705	0.222	0.430	0	0	0	0	0	
Hazel Lake	Sockeye					0.783	1.000	1.250	1.300	1.000	1.000	0	
English Bay Lakes	Sockeye							0.350	0.241	0.290	0.581	0.800	
Bear Lake	Sockeye						2.200	2.400[a]	1.619[a]	2.370[a]	1.813	0.170	
Total Sockeye		2.110	2.018	4.009	4.594	8.399	11.380	11.750	8.610	10.060	8.294	1.270	
Tutka Bay Hatchery:	Pink	14.73	19.560	22.500	19.570	12.00	30.100	23.600	23.600	23.600	43.000	61.000	
	Chum	0	0.018	0.449	4.050	0	2.103	1.500	0	0	0	0	
		0.026				3.180							
Caribou Lake	Coho		0.139	0.138	0.150	0.150	0.182	0.180	0.180	0.150	0.150	0.064	
Seldovia Lake	Coho		0.083	0.072	0.045	0.045	0.080	0.050	0.050	0	0	0	
Seldovia Bay	Chinook				0.084	0.084	0.108	0.099	0.091	0.113	0.107	0.106	
Halibut Cove Lagoon:	Chinook		0.098	0.101	0.094	0.094	0.115	0.112	0.092	0.117	0.100	0.107	
	Pink			2.000	3.000	3.000	6.000	6.000	6.000	6.000	6.000	0	
Homer Spit:	Chinook												
	early		0.152	0.104	0.104	0.104	0.104	0.212	0.191	0.226	0.212	0.192	
	late									0.126	0.100	0.157	
	Pink				0.295	0.300	0.332	0.303	0.303	0.300	0	0	
	Coho					0.060	0.143	0.123	0.100	0.100	0.116	0.156	

[a] Includes both fingerlings and "zero check" smolts (see text).

Appendix Table 31. Catch of Pacific herring in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1974 - 1994[a].

Year	Southern		Kamishak		Eastern		Outer		Total	
	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
1974	110	7	2,114	26	47	5	384	26	2,655	45
1975	24	5	4,119	40	-		-		4,143	41
1976	0	0	4,842	66	-		-		4,842	66
1977	291	13	2,908	57	-		-		3,199	58
1978	17	7	402	44	-		-		419	44
1979	13	3	415	35	-		-		428	36
1980	-		-		-		-		-	
1981	-		-		-		-		-	
1982	-		-		-		-		-	
1983	-		-		-		-		-	
1984	-		-		-		-		-	
1985	-		1,132	23	204	7	12	2	1,348	29
1986	-		1,959	54	167	4	28	3	2,154	57
1987	-		6,132	63	584	4	202	9	6,918	69
1988	-		5,548	75	0	0	0	0	5,605	75
1989	170	6	4,801	75	0	0	0	0	4,971	75
1990	-		2,264	75	-		-		2,264	75
1991	-		1,992	58	0	0	0	0	1,992	58
1992	-		2,282	56	0	0	0	0	2,282	56
1993	-		3,570	60	-		-		3,570	60
1994	-		2,167	61	-		-		2,167	61
1974-93 Average	89	6	2,965	54	125	3	78	5	3,119	56
1974-83 Average	76	6	2,467	45	-	-	-	-	2,614	48
1984-93 Average	-	-	3,298	60	136	2	35	2	3,456	62

[a] Data source: ADF&G fish ticket database.

Appendix Table 32. Estimated herring biomass and commercial purse seine catch of herring in short tons, exploitation rates, average roe recovery, number of permits fished, and exvessel value in millions of dollars, Kamishak Bay District, Lower Cook Inlet, 1978 - 1994.

Year	Spawning Biomass[a]	Commercial Catch	Total Biomass	Percent Exploitation	Average Roe %	No. of Permits	Exvessel Value[b]
1978	800	402	1,202	33.4	-	44	[c]
1979	2,900	415	3,315	12.5	-	36	[c]
1980	-	CLOSED	-	-	-	-	-
1981	5,130	CLOSED	5,130	-	-	-	-
1982	4,835	CLOSED	4,835	-	-	-	-
1983	4,750	CLOSED	4,750	-	-	-	-
1984	2,885[d]	CLOSED	6,500	-	-	-	-
1985	12,188	1,132	13,320	8.5	11.3	23	1.0
1986	24,042	1,959	26,001	7.5	10.4	54	2.2
1987	29,200	6,132	35,332	17.4	11.3	63	8.4
1988	24,000	5,548	29,548	18.8	11.1	75	9.3
1989	30,900	4,801	35,701	13.5	9.5	75	3.5[e]
1990	17,400	2,264	19,650	11.5	10.8	75	1.8
1991	16,171[f]	1,992	18,163	11.0	11.3	58	1.3
1992	21,795	2,282	24,077	9.5	9.7	56	1.4
1993	28,869	3,570	32,439	11.0	10.2	60	2.2
1994	23,177[f]	2,167	25,344	8.5	10.6	61	1.5
1978-93 Avg.[g]	15,058	2,772	17,331	16.0	10.6	56	3.5

[a] Spawning biomass estimates are minimal estimates based on aerial surveys.
[b] Exvessel values exclude any postseason retroactive adjustments.
[c] Data not available.
[d] Spawning had already begun on first survey. Total spawning biomass estimate was higher than the peak survey estimate of 2,885 tons.
[e] Includes retroactive adjustment.
[f] Due to poor aerial survey conditions, spawning biomass was calculated from the preseason estimate of abundance, adjusted to match observed age composition samples in the catch.
[g] Average excludes 1980 when no data was available.

Appendix Table 33. Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969 - 1994.

Year	Dates of Openings	Total Hrs. Open	Harvest (short tons)	Catch Rate (st/ hr. open)	No. of Permits Fished
1969-73	No Closed Periods				
1974	1/1 - 5/20		2,114		26
1975	1/1 - 6/6	(Closed Iniskin Bay 5/17)	4,119		40
1976	1/1 - 5/21	(Closed Iniskin Bay 5/17; reopened Kamishak 6/2)	4,842		66
1977	1/1 - 5/31	(Closed Kamishak Dist. 5/12; reopened 5/14 - 5/17; reopened 5/29 - 5/31)	2,908		57
1978[a]	4/16 - 5/31	96	402	4.2	44
1979	5/12 - 5/15	72	415	5.8	36
1980	CLOSED	0	0		
1981	CLOSED	0	0		
1982	CLOSED	0	0		
1983	CLOSED	0	0		
1984	CLOSED	0	0		
1985	4/20 - 6/15	1,350 (56.2 days)	1,132	0.8	23
1986	4/20 - 6/13	1,303 (54.3 days)	1,303	1.5	54
1987	4/21 - 4/23	65	6,132	94.3	63
1988	4/22 - 4/29	42	5,548	132.1	75
1989	4/17 - 4/30	24.5	4,801	196.0	75
1990	4/22 - 4/23	8	2,264	283.0	75
1991	4/26	1	1,922	1,922.0	58
1992	4/24	0.5	2,282	4,564.0	56
1993	4/21	0.75	3,570	4,760.0	60
1994	4/25 4/29	0.5 1.0	778 1,338	1,556.0 1,338.0	35 53

[a] Management by emergency order began.